The Chemical Age

A Weekly Journal Devoted to Industrial & Engineering Chemistry

VOL. IV. JUNE 11, 1921 No. 104

Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to "The Chemical Age" is 21/- per annum for the United Kingdom, and 26/- abroad. Cheques, P.O.O.'s, and Postal Orders should be made payable to Benn Brothers, Ltd.

Editorial & General Offices—8, Bouverie Street, London, E.C.4.
Telegrams: "Allangas, Fleet, London." Telephone: City 9852 (4 lines).

Safeguarding of Industries

THE Safeguarding of Industries Bill, now before Parliament, deals with two commercial and industrial problems. The first is the protection for a period not to exceed five years of recently established key industries against foreign competition that might swamp them in their infancy. The second is the protection of all industries from the process known as "dumping." The remedy takes the same form in both cases, namely, the imposition of a duty equal to one-third of the value of the goods; the only difference is that the time limits vary. Whether such a duty will be sufficient to attain the objects in view will be shown by experience. Opinions have been expressed that it will not, but it is as much as the public could be reasonably expected to bear—for no purpose is gained by disguising the fact that the duty will fall on the consuming public—and with this measure of assistance the newly-established British industries must make good their position within the next five years or pay the inevitable penalty.

The goods chargeable under Part I. of the Bill are set out in the schedule. They comprise nine classes, the last of which consists of all synthetic organic chemicals (other than synthetic organic dyestuffs, colours, and colouring matters imported for use as such and organic intermediate products imported for their manufacture), analytical re-agents, all other fine chemicals and chemicals manufactured by fermentation processes. Goods consigned from and grown, produced, or manufactured in the British Empire will be exempt. From time to time the Board of Trade will issue lists defining the articles falling under the general descriptions in the schedule, and in the event of objection to the inclusion or exclusion of any article the complaint is to be referred to a referee appointed by the Treasury whose decision shall be final. The possibility of frequent changes in these lists may excite some uneasiness, but it is impossible to set out every detail in the Act or the Schedule, and we shall have to trust to the discretion of the Board of Trade.

In Part II. of the Bill, that relating to "dumping," the procedure is different. On complaint to the Board of Trade that foreign goods are being sold or offered for sale at prices below the cost of production or (owing to the incidence of exchange) at prices below those at which similar goods can be manufactured here, and that employment in any British industry is being or is likely to be seriously affected, the Board may refer the matter for inquiry to a committee. If the committee's report favours such action the Board may by order apply Part II. of the Act to the goods concerned, such order to be laid before the House of Commons for twenty-one days before it becomes operative. A committee for the purposes of this part of the Act shall consist of three persons selected by the President of the Board of Trade from a permanent panel of persons appointed by him who shall be mainly persons of commercial and industrial experience. An order made under Part II. shall, unless previously revoked by the Board, run for three years or any shorter period specified, but it may be renewed from time to time—except orders made on the ground of depreciation of foreign currency, which are limited to three years. The Bill is making steady progress through Parliament, and in spite of active opposition from Free Trade quarters, its passage may be regarded as assured.

Home Production of Oil

THE oil industry, which at one time went through every crisis undisturbed, is beginning to lose some of its vitality, in spite of the decidedly helpful influence of the coal dispute. As is well known, the prices of all fractions have fallen considerably, and by no means appear to have reached rock bottom. The lower values now ruling must necessarily direct attention to the question of whether, under such conditions, a native industry can ever prosper. We ourselves have always been a

little sceptical about the matter; and, while considering that the exigencies of war justified the exploration of every known source, we feel that with a return to ordinary conditions of competition the production of oils from shale can never as a process compete with the spouter. From the commercial standpoint, the laborious process of mining for shale cannot stand comparison with the moderately simple operation of drilling, the question of freightage from distant countries being a small matter in comparison. It is, however, always of interest to have an authoritative statement on matters of the kind, and we may refer our readers with advantage to the interesting resumé dealing with the home production of oil which Mr. E. H. Cunningham-Craig has contributed to the recently published edition of the *Petroleum Year Book*.

During the period when the casualties sustained by tankers from submarine attack had reached a high percentage, the Petroleum Research Department was formed for the purpose of advising as to the means wherewith an indigenous supply of oil might be obtained. Owing to the late stage at which these activities began, the inevitable delays which ensued, and the shortages of material and labour, the production of oil from new sources never went beyond the experimental stage during the war, and the armistice more or less put an end to the serious and comprehensive schemes which had been recommended. Some of these schemes are now being carried on by private enterprise, but it must be borne in mind that whereas the Government were out to secure oil regardless of cost and irrespective of by-products, the only legacy they left was a comprehensive collection of data. Mr. Cunningham-Craig remarks that it is unsafe to make any estimate as to what supplies of oil could be obtained if all the available sources were utilised. So much depends upon the success or otherwise of the exploitation of such deposits as the Kimmeridge shales of Dorset and Norfolk; but if all the available material was to be turned to account, this country could easily quadruple its output of oil from home sources, and the solid fuel problem would be far on the way to a solution. Very much more important results are possible, but still not yet in sight. At any rate, it is satisfactory to note that the problem of removing or reducing the sulphur content of the crude oils has been attacked if not entirely solved.

Utilization of Quarry Refuse

THE United States Bureau of Mines may always be looked to for helpful suggestions and original investigations. In some way or another the workers whom the director collects around him all appear to possess a marked ability for attacking almost commonplace problems of which in this country we are apt to forget the commercial importance, let alone their general interest. We have had frequent occasions to bring out into the open some of the minor facts which the Bureau has elucidated; and, judging by the correspondence we receive in connection with comments on some of the American work, our readers appear to appreciate these notices of investigations they might otherwise never hear of.

The present is the age of the conservation of material to the utmost limit. The time may come when we shall refuse to acknowledge the term "waste products," and in every branch of industry we are gradually turning to account all manner of what a decade ago was worthless material. Unfortunately, as a race we are inclined to be given to prodigality, and it takes a long period for the pleadings of the scientific worker to break through the general apathy of those who are responsible for the conduct of processes on a work's scale. As an illustration, we may, perpaps, take the everyday case of the more efficient utilisation of fuel. For years the academic worker has been crying in the wilderness. It is almost an everyday occurrence to find some authority pointing the way wherewith the fuel bill may be curtailed by half, but the big consumer is a conservative, if not sceptical, individual, and hesitates to change his methods unless compelled by some form of legislation.

As with fuel, so with other raw materials; but in some instances the remedies are so simple and profitable as to compel attention. One cannot, for instance, fail to be struck with the possibilities of turning to useful account the discarded material in slate quarries. It is a notable fact that from 80 to 90 per cent. of the gross production of some of these quarries is accumulated as waste. The United States workers have undertaken a study of the industry for the purpose of devising means for utilising this waste, and have carried out a number of experiments to determine its suitability as a filler for road asphalt mixtures. Tests were made both on asphalt bonded briquets and on standard sheet asphalt pavement mixtures. The results indicate that for resistance to impact slate dust is about equal to other fillers in bonded briquets, and somewhat superior in sheet surface mixtures. Its cementing value is superior to both limestone and Portland cement in asphalt bonded briquets, and intermediate between them in standard sheet surface mixture. Elutriation tests indicate that slate dust contains approximately 15 to 25 per cent. more of the fine dust that constitutes an effective filler than either limestone, rock or Portland cement. In volume weight slate is about equivalent to limestone, and approximately 10 per cent. superior to Portland cement. The cost of the dust is little more than half that of Portland cement, but its ability to compete in price with limestone is not yet established. The tests were not sufficiently comprehensive to give conclusive results, but they are definite enough to suggest possibilities of such importance as to induce further and more extended research both by slate producers and by manufacturers of asphalt road mixtures.

The British Association

THE preliminary programme just issued of the annual meeting of the British Association in Edinburgh from the 7th to the 14th of September, promises discussions of great interest and of wide variety. This year Professor Herdman will be succeeded in the presidency by Sir Edward Thorpe, who has chosen as the subject of his presidential address "Some Aspects and Problems of Post-War Science, Pure and

Applied." In addition to evening discourses by Professor Inglis on "A Comparison of the Forth and Quebec Bridges, showing the progress of cantilever bridge construction during the past thirty years," and Professor Herdman on "Edinburgh and Oceanography," there will be four public lectures to citizens by Sir Oliver Lodge, Dr. E. J. Russell, Professor A. Dendy, and Professor H. J. Fleure. The president of the Chemistry Section this year is Dr. M. O. Forster, who will deal in his presidential address with "The Laboratory of the Living Organism." In the case of several of the addresses by presidents of sections discussion will be permitted, but this rule does not apply to the Chemistry Section. This year the Council called together the sectional committees to consider common action, and out of many suggestions received several topics were chosen for discussion at joint meetings of sections. Thus the Chemistry Section will combine with the Mathematical and Physical Science Section in considering "The Structure of Molecules," and with the Physiology Section in discussing "Biochemistry."

The general officers of the Association have arranged, with the concurrence of the Sections, the hours for the principal items in the programme, so that at no time will more than two of the sectional addresses or discussions be in progress simultaneously, and generally it may be said that the arrangements have been very carefully thought out with a view to meeting the convenience of all attending them. It is interesting to note that the Association, having failed to regain its former concession of reduced railway fares for members, proposes that they shall be offered facilities for travelling by motor coach to Edinburgh from most of the University and many other principal towns in England at fares substantially less than those by rail.

£30,000

ACCORDING to an answer given in the House of Commons on Monday the amount of duty collected under the German Reparation (Recovery) Act up to the 2nd inst., was £30,000. This cannot be regarded as a very big contribution towards the discharge of German indebtedness, especially as it is not known how much of it really comes from the British consumer, and how much it has cost the British Government to collect it. In addition to this, at a time when trade needs to be encouraged in every direction, traders are finding considerable difficulty in obtaining release of goods and in other ways. No doubt the Customs officials are finding it hard in view of the novelty of the position and the constant issue of new orders to cope with the business, but that, although a fair excuse, is not much comfort to the merchant who has orders in hand and cannot meet them because his goods are held up. With the general purposes of the Act there may be considerable sympathy, but it still looks as if the practical commercial aspects had not been very fully examined. The replies to questions in the House merely impress one with the very slight first-hand acquaintance with the facts that Ministers seem to possess, and with their rather light-hearted handling of matters which seriously affect business interests.

Laboratory Glassware, etc

THE question of the quality, supply and prices of British laboratory glassware, porcelain and chemicals, including research chemicals, is under consideration by a Committee of the British Science Guild. The Committee, the Chairman of which is Sir Richard Gregory, is anxious, in view of the conflicting statements which have appeared from time to time on these matters, to obtain the views of scientific workers who have experience of recent articles of the kind described, both of British and foreign manufacture. It is obvious that the information can be of use only when it applies to goods of definitely known origin. The points on which information is desired are the quality of the goods; their price as compared with that of imported articles of the same quality; the facilities for obtaining supplies; and the effects, if any, on research work of restrictions imposed on the importation of German goods. The Committee would also welcome statements made, or reasoned conclusions arrived at, by competent bodies who have investigated these questions recently, and by manufacturers who wish to add any further definite information to that which has already been published. The information should be sent to the Secretaries of the Committee, Prof. J. R. Partington, East London College, or Mr. C. L. Bryant, 23, Peterborough Road, Harrow, as soon as possible.

The Calendar

June		
11	The Mining Institute of Scotland: General Meeting.	Edinburgh.
16	Royal Society: Papers by J. R. Partington; A. B. Wood, F. B. Young; M. A. Giblett; F. C. Toy.	Burlington House, Piccadilly, London.
16	Chemical Society: "The Natural Photo-synthetic Processes on Land and in Sea and Air and their Relation to the Origin and Preservation of Life upon the Earth," by Professor B. More. 8 p.m.	Institution of Mechanical Engineers, Storey's Gate, London.
17	Royal Institution of Great Britain: "Chemical Combination and the Structure of the Molecule," by Sir J. J. Thomson. 9 p.m.	Albemarle Street, Piccadilly, London.
17	Royal Photographic Society of Great Britain: "Foregrounds," by J. C. Warburg. 8 p.m.	35, Russell Square, London.
20–24	Annual Chemists' Exhibition ...	Central Hall, Westminster, London.
29	Society of Chemical Industry: Nottingham Section.	Nottingham.

Books Received

PNEUMATIC CONVEYING. By E. G. Phillips. London: Sir Isaac Pitman & Sons, Ltd. Pp. 108. 2s. 6d.

TECHNICAL METHODS OF ANALYSIS. Edited by Roger Castle Griffin. London: McGraw-Hill Book Co., Inc. Pp. 666. 33s. net.

REPORT ON THE INDUSTRIAL, COMMERCIAL AND ECONOMIC SITUATION IN POLAND. By R. E. KIMENS. London: H.M. Stationery Office. Pp. 67. 2s. net.

The Development of an Oil By-Product Industry

By Dr. Eric K. Rideal

Dr. Rideal throws some interesting new light on the possibility of running a by-product industry in connection with oil, in much the same way as is done with coal. For instance, he refers to the fact that a much higher yield of fixed nitrogen may be anticipated with oil than is obtained during the carbonization of coal.

THE by-products recovered in the distillation of coal have attained such importance from the economic as well as from the national standpoint that it is a matter of interesting speculation whether the advantages attainable by compulsory legislation forbidding the employment of any other except carbonised or semi-carbonised coal as fuel do not outweigh the defects always associated with restrictive legislation. Similar conditions, however, do not obtain in the case of oil fuels. Over the wide range of such fuels, from petrol for internal-combustion engines to the semi-solid hydrocarbons employed for steam raising, very little work has yet been accomplished to found a by-product industry.

The recent stimulation to the employment of oil for power purposes raises the question of the possibilities of such a development from one of mere theoretical interest to the domain of one in which the economic advantages likely to accrue from a venture in this direction are of fundamental importance. Owing to the enormous demand for fuels of various types the oil industry has in the past been more concerned with such problems as altering the commerical cut ratios by cracking and similar means, methods of purification entailing the minimum loss of unsaturated hydrocarbons, and sulphur removal, than with the potentialities of founding new industries.

A closer investigation of the problems of fractional distillation or fractional condensation to adjust the composition of the cuts and the disposal in the most economical manner of the acid sludges is receiving attention at the present time.

Crude oil contains, in addition to the hydrocarbons, varying proportions of nitrogen, sulphur and oxygen, as is instanced by the following typical average analyses :—

PERCENTAGE ANALYSIS.

Oil.	Carbon.	Hydrogen.	Nitrogen.	Sulphur.	Oxygen.
Pennsylvania crude	86·06	13·88	—	0·06	—
California crude...	84·00	12·70	1·70	0·75	1·20
Texan crude ...	85·05	12·30	0·70	1·75	—
Trinidad asphalt	82·60	10·50	0·50	6·50	—
Oklahoma crude	85·70	13·11	0·30	0·40	—

Very little work has been accomplished to elucidate the nature of the oxygen compounds in natural crudes, and their commercial value is thus quite unknown. It is interesting, however, to note that the writer has succeeded in isolating small quantities of fatty acids, chiefly adipic, from the oil sands of Baku, indicating that some fractional oxidation probably under the catalytic influence of the sand surface has taken place at ordinary temperatures.

In many cases sulphur is present in the free state in natural oils undergoing reaction during the process of distillation. Although in well-managed gas works a slight profit can be made on the oxide box recovery and catalytic manufacture of sulphuric acid, yet in the case of oil refining the difficulties at present inherent in all sulphur-removal processes are so great that sulphuric acid has still to be obtained from an outside source. A solution to the problem of economic sulphur removal would simultaneously make the oil industry self-supporting in respect to this acid.

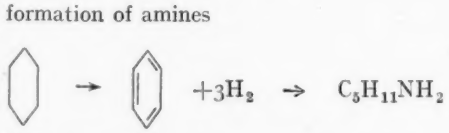
The manufacture of sulphonated products for the various organic industries such as the dyes, Twitchell reagents for fat splitting, flotation oils, are minor industries hinging on the sulphur.

The presence of nitrogen in the crude oils from California and Texas has not attracted the attention which it deserves. Both these oils are relatively rich in nitrogen, and if present in such a form as to be convertible into ammonia they would, in fact, be superior to coal as a source of by-product ammonia. Even if the recovery were as low as in the case of coal carbonisation, Californian oil would prove superior to an average coal. In the following table is a summary of the yields of ammonium sulphate (24·5 per cent. NH_3) recoverable from these oils in comparison with the recovery actually obtained for coal and shales :—

	Year.	Ammonium sulphate (24·5%NH_3) Per ton.	Maximum attained.	Possible average.
Coal coking ...	1917	18·19	34·5	25
Produce gas recovery plant ...	1911	85·87	113 on the addition of lime	
Low-temperature carbonisation...	—	14·28	—	28
Gas manufacture	1911-1913	24·07	—	24
Texan oil ...	0·70% N=0·85%NH_3=77·63 lb. per ton ammonia sulphate			
Californian oil ...	1·70%N=2·06%NH_3=188·38 lb. per ton			
Coal, average content ...	1·20%N.			

Although the average nitrogen content of crude oil does not greatly exceed the average nitrogen content of coal, a much higher yield of fixed nitrogen is to be expected from the former than is obtained during the carbonisation of coal. The recovery of fixed nitrogen from coal by retorting is accompanied by a very marked destruction of the complex nitrogenous substances present in the elementary gas. In oils, at least in Californian crudes (Mabery and Hudson, *J.C.S.I.*, 19, 505, 1900), the nitrogen is present as a mixture of bases and can be readily recovered by any of the well-known methods. These bases consist chiefly of a mixture of hydrogenated pyridine and quinoline, although in addition small quantities of thiocyanates have been isolated from Texan crudes. The behaviour of both pyridine and quinoline, which can conveniently be recovered from the sludge acids, in the presence of various catalytic agents has been examined by numerous investigators, notably by Sabatier, Ciamciam and Padoa. Hydrogenation may be effected at temperatures below 175°C. in the presence of reduced nickel, but the reaction does not proceed so smoothly as is the case with the corresponding aromatic ring compounds benzene and naphthalene. Above 175°C. the reverse reaction of dehydrogenation becomes more marked and occurs rapidly at a temperature of 250°C. At this and at more elevated temperatures both the dehydrogenated and the hydrogenated ring structures become unstable and secondary decomposition occurs. The secondary decomposition takes place in two definite stages :—

(1) The formation of amines

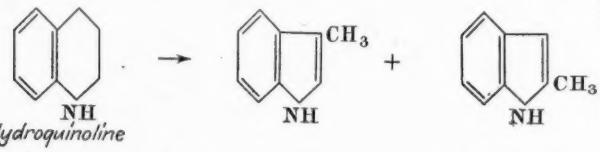


Piperidine Pyridine

(2) The decomposition of the amine with hydrogen with the formation of a hydrocarbon and ammonia—

$$C_5H_{11}NH_2+H_2 \longrightarrow C_5H_{12}+NH_3$$

The dehydrogenation and degradation of tetrahydroquinoline at the surface of hot nickel pursues a more complicated path than is the case with piperidine, since at 180° C. skatol and α-methyl indol are formed. The



Hydroquinoline

α-and β-methyl indols undergo subsequent degradation to propane and ammonia with the simultaneous production of aromatic hydrocarbons. Another possible reaction which proceeds smoothly at the surface of suitable catalytic materials, especially thoria and alumina, is the hydrolysis of the amines with the aid of steam. In the case of amylamine hydrolysis proceeds as follows :

$$C_5H_{11}NH_2+H_2O \rightarrow C_5H_{11}OH+NH_3$$

The simultaneous production of an alcohol with the ammonia would offer some economic advantages over the former process.

It is significant to note that in the catalytic decomposition both at the surface of nickel at relatively low temperatures and at the surface of hot carbon at higher temperatures the nitrogen is almost completely eliminated in the form of ammonia.

The whole problem of a by-product nitrogen recovery plant in the oil industry is thus greatly simplified in that the nitrogen originally present can be readily extracted as salt forming bases and that the subsequent catalytic decomposition of these bases with ammonia is attended with very small losses.

The ultimate disposal of the ammonia thus recovered presents no difficulty in an industry where large quantities of sulphuric acid are annually employed in the usual processes of oil refining.

In addition to by-product ammonia a smaller field for development lies in the manufacture of fine chemicals, derivatives of quinoline, pyridine and of the aliphatic amines produced by their decomposition. The impurities present in commercial crudes are evidently capable of commercial exploitation, and in the case of nitrogenous oils offer hope of a by no means inconsiderable development.

In addition to these residuals we have in the actual conversion of the hydrocarbons into materials of greater value than fuel for the industries another almost unexplored field for scientific and industrial development. Until quite recently, with the exception of the manufacture of chlorinated hydrocarbons for solvent purposes and the manufacture of carbon black from oil gas, very few attempts had been made to find outlets for the natural liquid hydrocarbons other than fuel.

The demand for benzene and its derivatives during the period of the war drew attention to the presence of these substances as well as of cycloparaffins in various natural crude oils ; the existence of large quantities of such materials as well as the means of conversion of open chain hydrocarbons into cyclic compounds by cracking processes conducted in the presence of suitable catalytic materials such as the halides of aluminium and zinc, permits of the utilisation of aromatic hydrocarbons for the fine chemical industry.

Closely connected with the oil industry, but still in the experimental state, may be mentioned the possibility of the direct synthesis of rubbers and the preparation of methyl alcohol and formaldehyde from methane. The production cost of rubber from the rubber tree is relatively low, averaging about fivepence per pound. It is evident that for an artificial synthesis the raw material must be cheap, and the paraffins alone under present economic conditions offer hope of a possible source of raw material.

According to Ostromosslenski (*J. Russ. Phys. Chem. Soc.*, 47, 703, 1905), synthesis of isoprene which on polymerisation yields methyl caoutchouc is possible through the following series of reactions :

$$C_6H_{14} \rightarrow C_4H_8{=}CH_2+CH_4 \rightarrow CH_2{=}\overset{\displaystyle CH_3}{\overset{|}{C}}{-}CH{=}CH_2.$$

N. Hexane. N. Pentene. Isoprene.

These reactions in common with most pyrogenetic reactions give a very low yield, being accompanied by thermal degradation to carbon, hydrogen and tar. Thus, although the synthesis of rubber from crude fractionated oils is a possible development, yet from the economic point of view there is at present but little to be said in its favour.

The position with respect to the oxidation of methane is somewhat more favourable. The demand for both methyl alcohol and formaldehyde is rapidly increasing, whilst their potential source in wood distillation is diminishing. Although eventually the manufacture of both these materials will probably entail the use of formic acid as raw material, yet the existence of large quantities of natural gas has not failed to attract investigators as to the possibility of its fractional oxidation. Already, as early as 1898, Glock showed that small quantities of formaldehyde were produced in the passage of air methane mixtures over granulated copper maintained at 800° C. More recently Bone has found that methane undergoes fractional combustion at the surface of borosilicate glass beads and by the passage of air methane mixtures through these hot quartz tubes formaldehyde may readily be produced in relatively large quantities. At points where natural gas is available a development of this method on an industrial scale may reasonably be anticipated.

During the last four years the fractional oxidation of the higher hydrocarbons of the paraffin series has attained a certain measure of success, and a successful development of a suitable process will have far-reaching effects in industry.

The products obtainable by fractional oxidation include the fatty acids which can be directly employed in the soap industry. Opinion as to the nutritive value of free fatty acids is still not unanimous, but esterefication of the free acid with glycerol or alternatively with a cheaper alcohol, *e.g.*, one of the sugars, would readily provide a source of butter and lard substitutes, utilising a raw material many times cheaper than the animal and vegetable oils at present employed in margarine manufacture. The production of oxides such as myricil palmitate by condensation of an alcohol and acid both produced by fractional oxidation of the hydrocarbons would yield raw materials for the candle industry, for the production of honey-comb, boot and floor polishes, and would prove a valuable adjunct in the paint and varnish industries. Sabatier and Mailhle were the first to show that by the vaporisation of the aliphatic hydrocarbons in an air current and passage over various oxides, especially those of copper nickel and cobalt, small quantities of alcohols and of aldehydes were produced. More recent experimenters have, as in the case of the hydrogenation of the unsaturated hydrocarbons first studied by Sabatier, inverted the process. Air or oxygen is passed through the liquid hydrocarbon containing a suitable catalyst in solution or suspended. In some cases oxidation is effected at high pressure in a pressure bomb. Since 1919 numerous patents and a few publications in the current scientific literature have appeared relating to this subject. Several of the patents are unworkable, at least on a small scale, and the experimental data of the observers are frequently at variance with one another. The more important work on the subject has been published

by F. Fischer and W. Schneider, A. D. Grün, Kelber H. Franck, Bergman, Ubhelohde and Eisenstein, of which the following is a brief summary.

In the experiments of Fischer and Schneider crude paraffin wax mixed with a dilute aqueous solution of sodium carbonate or caustic soda was heated to 170°C. in a steel bomb under an air pressure of a few atmospheres. It was found that oxidation readily took place, it being found advantageous to remove the soap formed from time to time, adding fresh paraffin wax and not attempting to obtain complete conversion of one batch of material. The velocity of oxidation was found directly proportional to the air pressure, and an elevation of 10°C. doubled the velocity of oxidation. The salts of iron, copper, and manganese were found to be catalytically active and approximately equal in activity. Mercuric oxide was inactive as a catalyst.

From the soda soluble fraction a number of fatty acids were isolated, comprising $C_{13}H_{26}O_2$, C_{15}, C_{17} and C_{19}, curiously enough all of the odd series of the normal saturated fatty acids.

Aldehydes and alcohols were isolated from the partially oxidised but non-soda-soluble portions. These investigators considered that the reaction was a simple case of oxidation proceeding in stages through the aldehyde and acid anhydride as follows :—

$$C_nH_{2n+1}CH_3 \rightarrow C_nH_{2n+1}CHO \rightarrow C_nH_{2n+1}CO\text{(O)} \rightarrow C_nH_{2n+1}COOH.$$

$$C_nH_{2n+1}CH_3 \quad C_nH_{2n+1}CHO \quad C_nH_{2n+1}CO\text{(O)} \quad C_nH_{2n+1}COOH.$$

In the experiments of Grün air at ordinary pressures was passed through heated molten paraffin wax for prolonged periods of time with the following results :—At 130°C. it was found that oxidation commenced both in the presence of oxygen and of air. At 150°C. a 50 per cent. oxidation was effected. To give some idea as to the rate of oxidation it may be mentioned that in twenty hours a 50 per cent. oxidation was effected with a gas containing only 1 per cent. of oxygen. With normal air which is richer in oxygen than the one per cent. gas employed the time for half conversion was reduced to from four to five hours. Fatty acids of high molecular weight were obtained. In contradistinction to the work of Fischer and Schneider Grün could not catalytically accelerate the oxidation by the addition of oxides or salts, and alkalis in all forms were found to exert a very marked substitutive influence. On the other hand, a fatty acid, *e.g.*, stearic, appeared to exert a distinct positive catalytic action. For each test Grün employed a one hundred gm. sample of good paraffin wax of M.P. 52°C. The fraction of the material which had undergone oxidation and was left over after extraction with alcohol was found to consist of wax. The wax possesses the folowing characteristics, and it will be noted that this synthetic material resembles beeswax very closely. The average figures for beeswax are appended for comparison :—

	Synthetic Wax.	Beeswax.
Acid No.	21·0	20
Saponification No.	75·6	95
Rapid	3·6	3·6
Iodine	4·7	9

Ubbeholde and Eisenstein found that manganese stearate was a valuable catalytic agent, and showed that in addition to the oxidation of the hydrocarbons degradation simultaneously occurred with the formation of volatile acids from which butyric, valeric and caprylic were isolated. Kelber likewise employed air at ordinary pressures as an oxidising agent and appears to have paid special attention to the isolation and identification of the various products of oxidation.

As an average yield he obtained 10 per cent. of volatiles consisting chiefly of ketones, alcohols and fatty acids of low molecular weight. In addition he obtained a 90 per cent. yield of fatty acids of general characteristics—

Iodine No.	1-2.
Saponification No.	250-300.
Acid No.	200.

As method of analysis the following procedure was adopted :—

1. Repeated washing with warm water.
2. Saponification with caustic soda.
3. Reprecipitation of the fatty acids followed by extraction with ether.
4. Precipitation of the potassium salts with acetone water mixtures.
5. Esterification and distillation under low pressures.

The ester fractions distilling over at 6 mm. pressure were as follows :—

Temperature.	Percentage of distillate.
0-120°C. ...	5
120-200°C. ...	56
200-230°C. ...	25
230-250°C. ...	14

Kelber made the very suggestive observation that if a paraffin wax be heated in an air current at 150-160°C. for a considerable period of time no oxidation will be found to have occurred, although an exothermic reaction takes place during the whole period. It is only after a definite interval has elapsed that oxidation commences. On the other hand, if a paraffin be heated in the absence of air for a long time and then air be suddenly admitted oxidation commences immediately.

It is thus evident that process cannot be one of simple oxidation as suggested by Fischer and Schneider, since it is evident that some change prior to the oxidation process must have taken place if Kelber's observations are correct.

It might be suggested that the preliminary reaction is one of dehydrogenation with the formation of a double bond, which is subsequently followed by the direct addition of oxygen and a tautomeric conversion to an aldehyde—

$$-CH=CH_2 \rightarrow -CH\text{(O)}-C_1H_2 \rightarrow -CH_2-CHO.$$

It will, however, be noted that there are other discrepancies between the observations of the various investigators. Thus the dependence of the reaction velocity on the gas pressure observed by Fischer and Schneider indicates a process of diffusion rather than a chemical reaction; the temperature coefficient of the reaction however indicates the reverse. Again it still remains to be established whether alkalis do or do not affect the reaction velocity, and whether failure of catalysis in many cases is not to be attributed rather to the formation of oil or wax insoluble compounds than to the absence of any catalytic properties in oil or wax soluble oxygen carriers.

Scientific Societies' Needs

THE fourth report of the Conjoint Board of Scientific Societies states that the board has received evidence that scientific investigation is being seriously hampered by the heavy cost involved in the publication of results. An exceptional number of papers are being communicated to the scientific societies, including many held up during the war while the resources of the societies, which have not increased, are insufficient at present prices to publish even the normal pre-war number. It is urged that steps should be taken to call an Imperial Water Power Conference in London at which the various Dominions and Dependencies of the Empire should be represented. The outcome of such a conference might well be the creation of an Imperial Water Power Board, with extensive powers to carry out a comprehensive policy for stimulating, co-ordinating, and where necessary, assisting, development throughout the Empire.

International Rubber Exhibition

Notes on the Chemical Exhibits

THE fifth Rubber Exhibition, which was opened on Friday, June 3, at the Royal Agricultural Hall, London, differs from previous exhibitions in that its scope has been extended to embrace the interests of all tropical products and allied industries. A notable feature is the excellent decorative treatment of stands, which, combined with tasteful arrangement of products, makes the exhibition most attractive from the visitor's point of view. Sir Owen Philipps, M.P., is acting as honorary President and Professor W. R. Dunstan as honorary Vice-President. Lord Leverhulme is a member of the honorary Executive Committee, while the honorary Advisory Committee includes Professor P. Carmody, Dr. R. S. Clay, Professor Farmer, Dr. S. Rideal, Mr. E. R. Bolton, and Dr. Philip Schidrowitz (who, it will be recollected, was the author of the series of articles on "Recent Developments in Rubber Technology" which appeared in THE CHEMICAL AGE in April).

In view of the dependence of the rubber industry upon the chemical industry for its compounding ingredients, manufacturers of the latter are well represented at the exhibition. India rubber manufacturing, fillers, coloured pigments, drugs and chemicals are exhibited by Louis Minton, of Trevelyan Buildings, Manchester. The General Experimental Station of the Netherlands East Indies has a comprehensive exhibit which includes samples of oil-palm seeds and palm fats, with various content of free fatty acid.

At the stand of the Netherland Government Rubber Institute demonstrations are given of the principal methods for the chemical analysis of crude and vulcanised rubber as adopted by that Institute. Viscosity determinations are shown with the Capillair viscosimeter of Ostwald and with apparatus similar to that used by Schwarz for viscosity measurements of nitrocellulose. Demonstrations are also given of mechanical testing methods, dry-heat tests and vulcanisation experiments, and there are a number of samples showing the influence of light on masticated rubber.

The United Chemical Works, of Amsterdam, who are represented in this country by Mr. K. Rayment, of 2, Broad Street Place, E.C.2, show their "Superol" brand of antiseptic which is claimed to prevent "rustiness" in sheet rubber, while James Lyne Hancock, Ltd., of 266, Goswell Road, E.C.1, have a representative display of mechanical rubber goods for the chemical and other industries. There is also on view a collection of relics relating to rubber manufacture in the past. The exhibit of Typke & King, Ltd., of the Crown Chemical Works, Mitcham Common, Surrey, comprises practically all the compounding ingredients used in rubber manufacture, foremost of which they place the various grades of antimony sulphides.

Other products shown include a mineral rubber known as Rubpron, such colours as red pigment "E," scarlet stain, vermilion, black hypo, Nos. 1 and 2; as well as cadmium sulphide, yellow arsenic sulphide, green oxide of chromium, brilliant green, neutral sulphur, precipitated sulphur and aluminium flake. Forster & Gregory, Ltd., of Lonesome Chemical Works, Streatham Common, S.W.16, show antimony sulphurettes in various shades, india-rubber substitutes and other chemicals used in rubber manufacture.

India-rubber substitute is also one of the prominent features at the stand of Alfred Smith, Ltd., of Excelsior Works, Clayton, Manchester, and in addition sulphide of antimony, barytes, carton bisulphide, carbon tetrachloride, litharge, Bucoxide, solvent naphtha, &c., were displayed.

Lever Brothers, Ltd., and their associated companies have an interesting display of raw materials and finished goods. Among the former were samples of palm oil, palm kernels, and ground nut oil, ground nuts (decorticated and undecorticated), sesame oil and such products. The exhibits of manufactured products on this stand include soaps, margarine, stearine and glycerine.

An organic accelerator known as "Anchoracel," is shown by the Anchor Chemical Co., Ltd., of Clayton, Manchester, who also specialise in reclaimed rubbers, zinc oxide, antimon sulphur chloride, litharge, &c. The exhibit of Cookson & Co., Ltd., of Newcastle-on-Tyne forms, the firm state, the most comprehensive display of chemicals used in rubber manufacture. Lead and antimony are shown in the raw state, and the chief compounds obtained from these metals are shown in the form in which Messrs. Cookson have produced them. Exhibits of other compounding ingredients supplied by Cookson, Budd & Co., Ltd., and the British & Foreign Metal & Chemical Co., Ltd. (subsidiary companies of Messrs. Cookson) are also included in the stand. The Washington Chemical Co., Ltd., of Washington Station, Durham, England, who are the sole manufacturers of "Pattinson's" Magnesia (carbonate and calcined, in light and heavy qualities), have an attractively decorated stand, blocks of magnesia of various sizes contributing to this effect. Leatherite (Pegler's Compound) for jointing, hose, &c., and which, it is claimed, resists acids, oil, tar and alkaline liquors, is seen at the stand of the Northern Rubber Co., Ltd., of Retford, Notts., while the North British Rubber Co., Ltd., of Castle Mills, Edinburgh, show samples of practically everything that can be made from rubber. They are showing a new production, known as "Paraflex" rubber carpeting, which would appear to be of considerable use in mills and factories, and particularly in forming beds for machinery. The company, who claim to be the largest rubber manufacturers in the British Empire, also display on their stand samples of sheet rubber and insulation for valves, washer joints, &c.; suction and other types of hoses; conveyor, elevator and driving belts, and gloves for electrical and acid work.

At the stand occupied by the African & Eastern Trade Corporation, Ltd., and associated companies, are exhibits of palm oil, palm kernels, rubber and ground nuts by the parent company; soap by T. H. Harris & Sons, Ltd., Stratford; and refined cocoanut oil, palm kernel oil, palm oil, &c., by Loders & Nucoline, Ltd., of 1, Crutched Friars, E.C.3.

Judging from the number of interested inquirers at the stand of the Peachey Process Co., Ltd., of Willesden, the interest aroused when Mr. Peachey's new vulcanising process was announced appears to be increasing steadily. The process, it will be remembered, is based upon the discovery that when rubber, or a compound containing rubber, is exposed alternately to the action of sulphur dioxide and of hydrogen sulphide, the two gases diffuse into the material, and interacting therein with the liberation of nascent sulphur, bring about a rapid vulcanisation without the aid of heat. One of the many interesting exhibits on the stand consisted of gels of vulcanised rubber produced by the new solution process and coloured with coal tar dyestuff. James Ferguson & Sons, Ltd., of 29, Gracechurch Street, E.C.3, have a display of "Nestor" shredded reclaimed rubber, and recovered and ground rubber generally; while Orr's Zinc White, Ltd., of Widnes, have a show of Orr's zinc white, for which James Ferguson & Sons, Ltd., are the sole selling agents to the rubber industry.

The Northern Polytechnic Institute, Holloway, show exhibits illustrative of the rubber technology courses conducted at the Institute; chemical apparatus and materials at various stages of testing.

Pioneers of rubber sulphur, and inventors (in 1887) of the Chance sulphur recording process, Chance & Hunt, Ltd., of 61 & 62, Gracechurch Street, E.C.3, have a representative display of their manufactures which include the "Fortress" brand of chemicals specially prepared for the rubber industry.

Machinery used in the manufacture of rubber is naturally represented at the present exhibition and is shown by Joseph Robinson & Co., Ltd., of Salford, who exhibit creping mills and sheeting machines; R. Fauset Gillespie & Co., 42, Frederick Street, Edinburgh, who show creping and washing machines; Robert Beby, Ltd., of 63, Queen Victoria Street, E.C.4, whose exhibit includes linseed cleaning machines, and machines for cracking palm nuts; Joseph Baker, Sons & Perkins, Ltd., of Kingsway House, Kingsway, W.C.2, who have a large and comprehensive display of masticators and mixers, washers, &c.; Francis Shaw & Co., Ltd., of Corbett Street Ironworks, Bradford, Manchester, who show the Hunter system of drying; and the Planters Engineering Co., Ltd., of 28, Martin Lane, E.C. 4, whose exhibit consists of a new type of patent continuous washer and drawings of oil-mill machinery, including planes suitable for expressing oil from rubber seeds, &c.

The autumn meeting of the Iron and Steel Institute will be held, by invitation of the Comité des Forges de France, in Paris, on September 5 and 6.

Fertility of Soils

Physico-Chemical Problems Discussed

SIR DANIEL HALL, K.C.B., F.R.S., presided at a general discussion organised by the Faraday Society on Tuesday, on "Physico-Chemical Problems Relating to the Soil." He said it was necessary to make an attempt to summarise the changed aspect of the problems involved in consequence of the development of the colloidal theory, and he hoped it would be possible, as the result of the discussion, to learn a good deal more about the relationship, for instance, of soil and water and the problems of the physical behaviour of the soil and especially the nature of the body called clay.

Dr. J. RUSSELL, of the Rothamsted Experimental Station, Harpenden, then gave a general survey of the subject. He said that for the present purpose they must look upon the soil as a complex system comprising four parts: (1) Mineral particles, being disintegrated and decomposed rock fragments which, through action of weather, water, ice and other factors, had in course of time been reduced to minute dimensions; (2) intermingled in most intimate fashion was the organic matter; (3) the soil solution, being the soil water and everything dissolved therein; the fourth was a matter of experiment rather than of simple observation; soil possessed colloidal properties, and therefore was assumed to possess a certain proportion of its substance in the colloidal state. Two hypotheses had been put forward, one to the effect that the colloidal properties are due to the fine particles known to be present; the other, and more recent, that they are due to a jelly surrounding each of the particles, but having a proportionately greater effect on the finer than on the coarser ones.

There were certain definite soil types which the investigator recognised by the vegetation, and which the chemist and the physicist were gradually beginning to characterise. Three general classes could be recognised; a soil might be formed from disintegrated rock, as in the Paleozoic soils of North Wales or the granite soil of Aberdeen; there might have been considerable decomposition; in our climatic conditions the tendency was for silica to accumulate and for the bases, including iron and aluminium oxide, to become reduced in quantity. In certain sub-tropical countries, however, the silica disappeared, and the iron and aluminium oxide accumulated, giving the so-called laterite soils. The soils consisting of disintegrated rock material were under investigation at Bangor by G. W. Robinson, and at Aberdeen by J. Hendrick and J. Orr, while the soils studied at Rothamsted consisted of decomposed rock material. So far, no fundamental difference seemed to have emerged in physico-chemical properties, though it was possible that there might be a difference in the colloidal matter—the disintegration soils might owe their colloidal properties to fine particles, while the decomposition soils possessed the jelly. Investigations had not yet proceeded sufficiently far to enable him to say much about the jelly. A good deal of work, however, had been done on the fine particles. These could be separated from soil by simple mechanical washing. No less than 20 per cent. of the soil at Rothamsted consisted of particles having a smaller mean diameter than 0·002 mm., ranging downwards to ultra-microscopic dimensions. This fraction was called clay; the name was too old to change, but it was unfortunate.

With a little ingenuity it seemed possible to explain on purely chemical grounds the difference between absorptively saturated and unsaturated soils, but the general properties of absorption showed so many similarities to absorption by colloids that the action would be, and had been, attributed to soil colloids. Again, however, it was possible for an ingenious chemist to show that the phenomena of absorption were explicable on purely chemical grounds. A chemist could allow himself considerable latitude, as remarkable chemical changes went on in the soil, such, for instance, as the decomposition of phenol, of potassium sulphocyanide, the conversion of calcium cyanamide into urea. Undoubtedly some soil constituents were very reactive. It was undeniable that chemical changes could, and probably did, take place, but these would be quite consistent with a preliminary physical absorption. If on other grounds it was necessary to assume the presence of colloids, we could not ignore them or deem them non-existent for purposes of absorption; we must take them into account.

Export of British Dyestuffs

Merchants and Exclusive Selling Agencies

NEGOTIATIONS which have been proceeding for some time past between the Chemical and Dyestuffs Traders' Association and the Board of Trade respecting the refusal of the Britith Dyestuffs Corporation to supply products to British merchants for export to foreign markets where they have their own selling and distributing agencies, has resulted in a slight concession to merchants. The correspondence arose on a case in which the Corporation declined to supply synthetic indigo to a firm of British merchants for export to China. In bringing the case to the notice of the Board of Trade the Association pointed out that the firm had for a long period been concerned in the export of indigo to the Far East; that in consequence of the Corporation's refusal to supply the goods the order had to be placed in Germany; and that such a policy tended to divert trade from this country to German, Swiss, or American dyestuff manufacturers, and was, therefore, a matter of national interest.

Several letters were received from the Board of Trade in the course of the negotiations. On April 2 the Board of Trade informed the Association "that they have been informed that the arrangements made by the British Dyestuffs Corporation with the firm acting as their agent in China are such that the Corporation is clearly precluded from making sales of their products to merchants in this country when it is known that the goods are destined for export to and sale in China." The Board were of opinion that the matter was one in which they were unable to take any action, but suggested "that merchants supplying the Chinese market should obtain their supplies in China through agents of the British Dyestuffs Corporation in that country."

In reply to this the Association pointed out that merchants strongly object to the disclosure of their customers' names.

The Board of Trade on May 21, replied "that as a result of further communication with the British Dyestuffs Corporation they are informed that the agents of the Corporation in China will not require the names of the ultimate consumers to be disclosed by the merchant obtaining supplies of synthetic indigo from them."

In their final letter the Association, while thanking the Board of Trade for taking the matter up, point out "that while the concession regarding the non-disclosure of the names of ultimate consumers is appreciated, it is not likely to prove of much actual value, as buyers here would find it impracticable to negotiate through an agency in Shanghai business in hand for an article manufactured in England and required for shipment from England."

Wave Transmission Action Settled

MR. JUSTICE SARGANT was informed in the Chancery Division on Tuesday of the settlement of an action by Mr. Gogu Constantinesco, of Weybridge, against Mr. Walter Haddon, engineer, carrying on business under the name of John Haddon & Co., London and Market Harborough, and managing director of W. H. Dorman & Co., of Stafford.

Mr. Johnston, for the plaintiff, said the latter, a Roumanian engineer, was the author of valuable inventions, one of which was the transmission of power by waves through liquid, known as the wave-transmission system. An application of this invention was G.C. control gear, which enabled machine-gun fire to be directed from aeroplanes through the propellers. Mr. Haddon entered into an agreement with the plaintiff, who was to develop the patent, and the defendant was to finance it. Unfortunately, the parties took divergent views, and in the course of their disputes the plaintiff wrote letters to Mr. Haddon, and perhaps made remarks elsewhere, which Mr. Haddon thought were a reflection upon his business capacity and integrity. He was now instructed by plaintiff to state that if he had made any such reflections he unreservedly withdrew them.

Mr. Compston, K.C., for Mr. Haddon, said he assented to the settlement and acknowledged the generosity of the statement just made. Mr. Haddon could not have compromised the action if any imputation upon his uprightness as a man of business had remained. That having been withdrawn in the most generous terms, Mr. Haddon gladly assented to the proceedings being stayed.

Industrial Respirators

Improvements on War Designs and Types

AT the meeting of the London Section of the Society of Chemical Industry on Monday, June 6, Dr. Leonard Levy and Mr. G. W. West read a Paper on industrial respirators, and outlined the developments that have taken place in their design as the result of experience with respirators during the war. The particular types of respirator dealt with used the same respirator canisters as were used during the war, but the fillings are different, owing to the difference in the problem which has to be faced under industrial conditions compared with war conditions. Four types were dealt with in the Paper, namely, ammonia respirators, respirators to give protection against neutral vapours, respirators to give protection against acid fumes, and carbon monoxide respirators. For ammonia respirators the most satisfactory absorbent is crystalline copper sulphate, while a very highly activated vegetable charcoal has been found to be the best filling for the absorption of hydro-carbon fumes. When dealing with acid gases, such as hydrochloric acid, chlorine, sulphuretted hydrogen, phosgene, sulphur dioxide, nitrous fumes, &c., it has been found that a mixture of slaked lime, kieselguhr, ferric hydroxide and activated charcoal gives the best results.

The production of a respirator for protection against carbon monoxide has presented some novel problems, because there is no known absorbent suitable for use in a respirator canister for the removal by chemical absorption of carbon monoxide from an atmosphere contaminated with this gas. The only method by which this result has been achieved so far is by the destruction of the toxic qualities of the gas by oxidation. Another difficulty is due to the fact that carbon monoxide differs from nearly every other known toxic gas or vapour from the fact that it has no smell, irritant or lachrymatory effect. There are two known methods by which the destruction of carbon monoxide by oxidation can be effected: (1) by the use of a mixture of iodine pentoxide and fuming sulphuric acid, and (2) catalytic oxidation by the oxygen of the atmosphere, by using certain special mixtures of oxides, such as finely divided manganese dioxide, copper oxide, cobalt oxide and silver oxide. It is on the latter line that the author has proceeded, and claims to have prepared a catalyst mixture which is not easily poisoned by water vapour. As carbon monoxide gives no irritant effect, it is necessary to provide a detector to warn the wearer of the respirator that it has accidentally failed, and this is provided by a thin layer of iodine pentoxide—fuming sulphuric acid on pumice granules, which oxidises carbon monoxide at ordinary temperature with the liberation of iodine, the vapour of the latter exerting a strong lachrymatory effect and irritating the membranes of the nose and throat.

Centrifugal Separators

Encouraging Results of Pioneering Work

AT the first annual general meeting of Centrifugal Separators, Ltd., held on Friday, June 3, at Winchester House, London, Sir Arthur Trevor Dawson, who presided, said that the accounts, which covered a period of eighteen months from the incorporation of the company, in October, 1919, to March 31 last, showed an adverse balance of £5,935. It was the opinion of the directors that had there not been such extreme depression in trade during the latter part of the period the financial result would have been quite otherwise. At the beginning of such an undertaking a great deal of demonstration, educational, and experimental work was necessary; and it was a matter of great disappointment that, when the pioneering work had been done—with extremely gratifying success in certain cases and general encouragement in pretty well all directions—the expected orders for machines were delayed, owing to a very natural reluctance on the part of manufacturers to embark on new capital expenditure during the trade depression. Having referred to the expenditure which had been incurred in demonstrating the value of the company's separator in dealing, for instance, with the effluent water from paper mills and distilleries, and in the clarification of sugar juice, he said that their experimental works at Peckham had been fully employed in testing samples of many different materials, very often in conjunction with customers' experts, and there were many matters which were completely worked out, where orders would certainly come when the present depression came to an end. The mechanical and chemical laboratories at Peckham had proved very valuable, and, as a result of the work done, certain new patents for improvements and developments were in contemplation, which would add to the value of the separator and extend its uses.

With regard to the foreign rights, negotiations had taken place with various countries, and an agreement had been arrived at with the Sharples Specialty Co. to work the United States patents under licence from this company on a royalty basis. The Sharples Specialty Co., who were thorough experts in centrifugal matters, had as a preliminary purchased four machines from the company, and provision had been made for a full and free interchange of technical information and experience between the two undertakings. It was the definite opinion of the directors that, as soon as the present depression in trade was over, the company would do very well, and that their belief in the value of the patents would be amply justified.

The report was unanimously adopted, and votes of thanks to the board and officials for the manner in which the company's interests had been looked after during a very trying period of trade depression were carried unanimously.

Manchester Chemical Trade

SIR S. W. ROYSE & CO., LTD., in their monthly circular, state: Business during May has been reduced to very moderate dimensions by the continuance of the coal stoppage and the intervention of the Whitsuntide holidays. The number of works closed through shortage of fuel and raw material has increased daily, and the position is a serious one. Transactions in sulphate of copper have been chiefly on export account, the demand for home consumption having been small, and price has eased notwithstanding the higher values ruling for the metal. The Board of Trade returns show exports for April to be 5,423 tons (£180,466) as compared with 2,915 tons (£110,296) for April, 1920. The figures for the first four months of the year are 20,444 tons (£775,876) as against 14,039 tons (£542,884) exported in the corresponding period of 1920. Green copperas continues scarce, and any available parcels realise full prices. There has been little call for acetic acid or acetates of lime and soda, and prices are easier. Acetates of lead have also been neglected, although the metal is firmer. Nitrate of lead is dull. Carbonate and caustic potash continue quiet, and Montreal potashes are offered freely at lower figures. Yellow prussiate of potash has received more attention, spot supplies are small and higher prices are also being realised for forward shipment. Prussiate of soda remains quiet. White powdered arsenic has been in good request at the lower figures ruling, but business is confined to small lots. Tartaric acid continues in good demand, and supplies are short. English makers being hampered by shortage of fuel supplies. Cream of tartar has moved more freely, the seasonal inquiry being well up to expectations. Good business is reported in citric acid for both home and export, price is higher and makers are booked well ahead. Bichromates of potash and soda are unchanged. Oxalic acid has an easy tendency though stocks are only moderate. Borax and boracic acid have been steadily called for. There has been a better demand from abroad for sal-ammoniac and muriate of ammonia, but actual business is negligible. Bleaching powder has been quiet, but caustic soda and ammonia alkali are in better request. Little is doing in chlorates of potash and soda, in spite of concessions in price. There is but little bsuiness passing in tar products, and prices are practically unchanged. Benzoles and toluoles are quiet. Solvent naphtha is in better request, owing to the strike of the waterproofers having come to an end, and consequently prices are a little firmer. Business in creosote remains quiet with values steady. Crude carbolic acid is without inquiry, and second-hand parcels of crystal carbolic are still pressed for sale. Naphthalenes are neglected. There has been nmore activity in the pitch market recently, principally for spot delivery and prices if anything have stiffened. Sulphate of ammonia is practically without change.

Action over Arbitrator's Award

A MOTION to set aside an arbitration award concerning a sale of salt cake was before Mr. Justice Lush and Mr. Justice Sankey, sitting as a King's Bench Divisional Court on June 3. The parties interested were Cowan Bros., Ltd., London House, Crutched Friars, London, who made the motion, and Mr. H. Wiskemann, of the Wool Exchange, London, the respondent. The hearing had been adjourned from a previous date for the production of a manufacturer's certificate of analysis, which Mr. W. Jowitt, for Cowan Bros., Ltd., said would show a higher proportion of sodium sulphate in the commodity than another certificate upon which the arbitrator based his award, and consequently would entitle them to a reduction of damages.

When the case came on on the resumption, Mr. Fortune, for the respondent, said that as to the difference in the analyses of a possible 82 per cent. and a possible 90 per cent., they had seen the other certificate and the analysis now turned out to be about 90 per cent. They had agreed that the amount of the award should be reduced to £150 7s. 4d. and that that amount should be paid forthwith. Each party were to pay their own costs, and the question as to who should pay the arbitrator's fees was left to their Lordships.

Their Lordships ordered the sellers to pay the arbitrator's fees.

Mr. Jowitt, in opening the case for Cowan Bros., Ltd., said they sought to set aside the award on the ground that the umpire based his award upon a document which was not evidence, and which did not relate to the particular goods, or might not have related to them. Cowan Bros., Ltd., sold two parcels of the salt cake to two different people. One lot of 500 tins was sold to Wiskemann, and the other of a similar weight to Mr. Bourgeois. Both parties resold the parcels to a Mr. Williams, who then sold to a Swedish firm.

The contract, so far as Cowan Bros., Ltd., were concerned, involved delivery f.o.b. Hull, and in pursuance of the contract in August, 1920, there was placed on board a steamer at Hull two consignments, one of 199 tons under the Bourgeois contract and a consignment of 150 tons under the Wiskemann contract for carriage to Sweden.

Although both parcels were supplied by Cowan Bros., Ltd., yet the source from which they had got them differed. The contract contemplated testing or sampling at the port of shipment, but this was not done until arrival in Sweden. Whether it was taken actually out of the hold no one knew, and no one knew whether it was part of the 150 tons or of the 199 tons.

However, an analysis was held and the umpire had based his decision upon this analysis in giving his award. The point was that no evidence was given which connected the analysis with a particular parcel. The certificate of the Swedish analysis showed a deficiency of sodium phosphates, but it did not indicate whether it was the result of the examination of samples from the respondent's consingments or that of Messrs. Bourgeois.

Mr. Fortune, for the respondent, submitted that the umpire had before him evidence generally as to the whole of the consingments.

On Mr. Jowitt stating that his clients could produce a manufacturer's certificate of analysis showing a higher proportion of sodium sulphate in the commodity than the Swedish certificate, the hearing was adjourned with the result as stated above.

National Dyes, Limited

First Year's Gross Profit of £62,098

THE first annual directors' report and accounts, from December 15, 1919, to December 31, 1920, were presented to the shareholders on Monday. The report shows that 786,703 lb. of colours and 306,848 lb. of intermediates were manufactured at the company's works during that period, which is considered satisfactory, especially having regard to the fact that the trade depression necessitated the complete closing down of the factories before the end of the year. The accounts show a gross profit, after making suitable provision for decline in market value of certain stocks of raw materials, of £62,098 19s. 8d., and after writing off £13,034 depreciation on plant, tools and machinery, £17,080 debenture and bank interest, also bad debts, stamp duties on debentures, &c., a balance of £6,610 is carried forward to the debit of profit and loss account.

Society of Public Analysts

THE ordinary meeting was held at the Chemical Society's Rooms, Burlington House, on Wednesday, June 1, Mr. Alfred Smetham (President) in the chair.

A certificate was read for the second time in favour of Mr. W. N. Stokes, B.Sc., A.I.C. The following were elected Members of the Society :—Messrs. Thomas Henry Pope, B.Sc., F.I.C., and William Ellard Woolcott.

Abstracts of Papers

In a paper on "The Composition of Egg Powder," by F. F. Beach, T. E. Needs, and Edward Russell, B.Sc., F.I.C., the authors recorded the results of the examination of so-called egg-powders, comparing them with ordinary baking powders. A table of composition was appended, and it was suggested that a standard based on certain specified figures might be laid down for a minimum percentage of actual egg in such preparations.

"The Colorimetric Method of Determining Hydrogen-Ion Concentration : some uses in the Analytical Laboratory," was the title of a paper, by Norman Evers, B.Sc., F.I.C., in which the colorimetric method of determining hydrogen-ion concentration by means of indicators was described. Examples were given of its usefulness in replacing titration methods in the determination of the "acidity" or "alkalinity" of various products, and of the purity of certain fine chemicals.

F. Robertson Dodd, F.I.C., in a contribution on "The Estimation of Woody Fibre in Cattle Foods," referred to the discrepancies between the results of different analysts working on the same sample by varying processes, and suggested a modification of the method which would tend to obviate this.

"The Spectrometric Examination of Certain Fixed Oils as a Means of Identification" was dealt with by H. C. T. Gardner. The author's observations went to show that mere spectroscopic examination of a fixed oil was not of itself sufficient but that evidence of identification could be obtained, in the case of certain oils, by measuring the positions of the terminations of visibility together with the extent of visibility of the absorption spectra of various oils. Generally dissimilar oils exhibit dissimilar limits of visibility of their spectra.

A paper on "The Joint Use of Two Indicators in the Titration of Acids and Bases" was submitted by J. L. Lizius, B.Sc., A.I.C.

Colour Users and the Dye Industry

Views of Mr. Vernon Clay

PRESIDING at the annual meeting of the Colour-Users' Association in Manchester on Friday, June 3, Mr. Vernon Clay said the Association had been heavily engaged upon the question of the Dyestuffs (Imports Regulation) Bill. It would be remembered that their Association pressed very heavily for, and had succeeded in getting a preponderance of consumers on the Licensing Committee. There were five consumers to three producers, four of the consumers, of whom he was one, being nominated by the Colour-Users' Association. It was felt that it was impossible to reconstruct their Association till the Government had clearly defined its policy as regarded the dye producers of the country. He thought it was the absolute duty of the Association, in the National interest, to establish dye-making in this country. It was also their duty to their trade customers that they should do so. Dye-making represented, in the main, the making of trained brains in organic chemistry. It was trained brains they wanted in time of war, and if they had not these trained brains in commission in a civilian sense they could not draw upon them in time of war. Before the war the industry was the most highly organised one in the world, and the German Kartel practically controlled, in some form or other, 98 per cent. of the dye-making of the world. He had joined the board of the British Dyestuffs Corporation because he thought he could do more to secure that end in that capacity than as the chairman of that Association.

Mr. H. SUTCLIFFE SMITH (Bradford), who was elected president of the Association, said that between now and 1925 it was imperative that they should make the utmost use of their members to develop the dye-making industry, so that Great Britain might never again find herself in the position she was in in 1914. It was also of paramount importance that co-ordination should obtain between the various bodies, and harmony and mutual consideration between the Colour Dyers'

Association, the Government Department, and the Licensing Committee and Development Committee now in process of being formed. They might be assured of sympathetic treatment from the Licensing Committee, and practical help from the British dye manufacturers, not only as regarded quantity and variety, but as regarded price.

Toilet Supply Company's Affairs

"Rash and Hazardous Speculations"

JOSEPH VINE (trading as the Toilet Supply Co.), manufacturer of toilet preparations, 222 and 224, Harrow-road, W., who failed in March last, applied at the London Bankruptcy Court on Tuesday for an order of discharge from liabilities amounting to £7,518.

Mr. Walter Boyle, Official Receiver, reported that the assets, valued by the bankrupt at £2,032 had so far realised £1,560, and a further £10 was expected. The debtor had stated that he began business in January, 1915, in partnership with his sister, as a wholesale and retail dealer in toilet preparations and soaps. Between May, 1915, and March, 1919, he served in the army, and on returning to the business paid his sister out. In August, 1920, he had recourse to a moneylender to enable him to meet his obligations. From November, 1920, to January, 1921, the bankrupt had delivered to him goods to the value of £7,338, most of which he had to sell under cost owing to the fall in prices. The bankrupt attributed his failure to lack of capital, bad trade, and depreciation in the value of stock, but in the opinion of the Official Receiver the business was crippled by the payment of £550 to the bankrupt's sister when she left the business.

The Official Receiver submitted in opposition to the discharge: (1) That the assets were less than 10s. in the £; (2) that the bankrupt omitted to keep proper books of account; (3) that he continued to trade after knowledge of insolvency; (4) that he had failed to account satisfactorily for the deficiency of assets; (5) that he contributed to the bankruptcy by rash and hazardous speculations; and (6) that he had given an undue preference to one of his creditors.

Mr. E. W. Hansell, for the trustee and committee of inspection, contended that the bankrupt had been extremely reckless in his trading, and asked for a lengthy suspension of the discharge.

On behalf of Joseph Crossfield & Sons it was submitted that if this class of trading were allowed, business would become impossible. The discharge ought to be refused altogether.

Mr. Registrar Mellor said that he had no power to refuse altogether a discharge where the debtor had not been found guilty of some kind of fraud. In this case, on the grounds reported by the Official Receiver, the discharge would be suspended for three years and six months.

Chemical Traders' Failures

H. O. H. Wiskemann

THE public examination of Heinrich Odomar Hugo Wiskemann, chemical merchant, Wool Exchange, E.C., was held on Tuesday at the London Bankruptcy Court, a statement of his affairs showing gross liabilities £20,885, expected to rank £11,012, against net assets valued at £6,975. The creditors recently accepted a scheme for the arrangement of the debtor's affairs which provided for a composition of 2s. 6d. in the £ over and above the amount realised from the assets.

In answer to the Official Receiver, the debtor said that he had failed on a previous occasion, namely, in February, 1889, when he was adjudged bankrupt in the High Court. He obtained his discharge in July, 1909. That bankruptcy, in which the debts were £8,288, was mainly due to the fact that his manager absconded with £3,000. He was a German and had never been naturalised in this country. From 1892 to 1907 he carried on in London a commission agency in chemicals. He was also manager of two chemical companies, one of which, called Wiskemann (Ltd.) took over his business connexion. Both companies were subsequently wound up. In March, 1907, he began business on his own account as a chemical merchant. After 1916, owing to his German origin, he was only allowed to continue under Government supervision. This supervision ceased in July, 1918, and he continued to trade until the date of the receiving order.

In the early part of 1915 he began business as a manufacturer of artificial pumice-stone at 144, Ormside Street, Old Kent Road, under the style of the Ormside Mills Co. He had been experimenting in the production of artificial pumice-stone for some years and had spent £1,000 on plant and machinery. On account of the prejudice against his nationality he agreed to sell the business to the manager for £2,200, payable in instalments. He continued to finance the business, though the manager only paid about £200 on account of the purchase price. In March, 1920, the business was taken over by a company then formed called the Ormside Mills, Ltd., in which he received 2,000 preferred shares in part payment of the amount due to him from his manager. He also subscribed for 500 similar shares. The company was now carrying on business at Redhill and expected to be successful. The examination was concluded.

Samuel Diamant

THE public examination of Samuel Diamant, importer and exporter of chemicals, 51, Castellain Mansions, Elgin Avenue, W., was held on Wednesday, June 1, at the London Bankruptcy Court, a statement of his affairs showing unsecured liabilities £7,582 and assets valued at £509.

In answer to Mr. W. P. Bowyer, Senior Official Receiver, the debtor said that he was born in Russian Poland, and in 1897 he began business in Antwerp as an importer and exporter of chemicals. On the outbreak of the war he came to this country as a refugee with about £500. Before leaving he gave authority to one, Untermann, to realize his goods in Belgium, which were valued at several thousands of pounds. In 1914 he began business in London as an importer and exporter of chemicals. He traded successfully until the end of 1916, but then closed the business owing to trade restrictions and ill-health. In September, 1919, he recommenced business at Elgin Avenue, and had since dealt chiefly in carbonate of potash. His failure was due to loss in trading and to his liability for damages and costs in actions for breach of contract to sell carbonate of potash.

The examination was adjourned for a fortnight, the debtor being ordered to hand over to the trustee certain agreements and other documents.

Powdered Fuel: The Cost Problem

AT its meeting last week the South Wales Institute of Engineers resumed discussion on the case for powdered fuel, as put in a paper by Mr. Robert James, Wh.Sc., D.I.C. Mr. James, in investigating the increasing use of coal in powdered form, analysed the pulverising costs of a plant dealing with 50 tons a day, and, after allowing for interest and depreciation, arrived at a total cost of drying, &c., of 7s. 6d. per ton. He stated that a plant for firing a Stirling boiler of 40,000 lb. per hour capacity with powdered coal on the Holbeck system was at present approaching completion at the electricity works of the Hammersmith Corporation. In this case the coal will be made as required in a self-contained turbo pulveriser, and the system will work under a slight vacuum, so that there should be no chance of c al dust escaping into the atmosphere. The application of coal ust firing to locomotives is under test by the Great Central Railway, Mr. J. G. Robinson, the chief mechanical engineer of which was said to be favourably impressed with the experimental results thus far obtained. The advantages claimed for coal-dust fired locomotives included sustained boiler power, automatic firing, reduction of heat losses, easy fuelling and ability to use inferior coal.

In the discussion on the paper Professor Bacon, of Swansea University College, remarked that the first thing to look for would be a very substantial saving in the matter of running expenses.

Debating the question from the point of view of anthracite coal, Mr. George Roblignes, of Ponthenry Colliery, said that any experiments should be carried out at the expense of the whole of the anthracite owners, as all would reap any benefits that might accrue. He was satisfied, however, that it would not be a profitable venture, and that the cost of pulverised fuel would be on the wrong side.

Mr. James, in replying, said that while great changes had been effected on the condenser and turbine sides, no advance had been made in boiler-house practice for many years. The great trouble to-day in boiler firing was the stoker trouble, and powdered fuel offered advantages that would improve the general efficiency of boiler furnaces. Whether it would pay to wash the fuel for metallurgical work must be a matter of cost.

Chemical Matters in Parliament

Second Reading of the Key Industries Bill

THE debate on the Second Reading of the Safeguarding of Industries Bill occupied the sittings of the House of Commons on Monday and Tuesday last. On the division there voted

For the second reading	312
Against	92
Majority	220

The Bill was then read a second time.

Anglo-Persian Oil

In reply to Lieut-Colonel Hall (House of Commons, June 2), who inquired if the Prime Minister was aware of the arrangements reported to be entered into by the Société Générale des Huiles de Pétrole with the Anglo-Persian Oil Company, Ltd., securing the supply from the latter of large quantities of oil for a period of 20 years; whether the representatives of H.M. Government on the board of the Anglo-Persian Company had approved of these arrangements; and whether, having regard to the shares held by the Government in that company, he would lay before the House full particulars of the arrangements,

Mr. Hilton Young said that the question appeared to relate to an ordinary commercial transaction of the company. The Chancellor of the Exchequer did not think that he would be justified in asking the company for particulars of the arrangements for the purposes of publication.

Colonel Wedgwood: Are not the majority of the shares in the Anglo-Persian Oil Company held by the British Government, and, therefore, are not the British Government entitled to have some say in contracts entered into which may prejudice British interests?

Mr. Young: Yes, surely, but only through the official directors on the board of the company.

Export of British Dyestuffs

Captain W. Benn (House of Commons, June 6) asked the President of the Board of Trade whether the British Dyestuffs Corporation refused to supply British export firms with synthetic indigo, on the ground that they had their own selling arrangements in the Far East, and that this decision tended to divert trade from this country to Germany, Switzerland and the United States, and what steps the Government proposed to take in the matter.

Sir P. Lloyd-Greame: I am informed that, under the arrangements made by the British Dyestuffs Corporation with their agents in China, the Corporation is precluded from making sales of its products to merchants in this country when it is known that the goods are destined for export to, and sale in, China. It is, however, open to merchants supplying the Chinese market to obtain their supplies in China through the agents of the British Dyestuffs Corporation in that country. I am informed that in all such cases the agents of the Corporation supply without requiring any information as to the ultimate purchasers. The Government is not responsible for the management of the British Dyestuffs Corporation, and the Board of Trade has no power to dictate to firms the terms of their agency agreement.

Proposed Laboratories at Beckenham

Mr. Hood (House of Commons, June 6) asked the Minister of Health, with regard to the application of Mr. H. S. Wellcome for a licence under the Housing and Town Planning Act, 1919, of the Langley Park estate at Beckenham, what were the safeguards and requirements referred to in the letter from the Ministry, dated May 28, 1921, addressed to the clerk of the Beckenham Urban District Council; whether he was aware that Mr. Wellcome had expressed his willingness to comply with such safeguards and requirements; that the licence granted by the Beckenham Urban District Council specifically provided for the premises not being used for the purposes of trade, but only for private research; that Mr. Wellcome was the proprietor of the business of a manufacturing chemist, and the premises were required for the purposes of supplying such business; and, if so, what was the position of the Beckenham Urban District Council in the matter.

Sir A. Mond: The facts of the case were considered at a public inquiry, at which full opportunity was afforded to all parties to make representations. The decision which has been conveyed to the Council was arrived at after considering all the circumstances. I have already sent to the Council a list of the conditions which it is suggested should be complied with in any development of this estate. The legal position has been set out in the letter forwarded to the Council.

German Reparation

Mr. Kiley (House of Commons, June 6) asked the Prime Minister if he were aware that traders importing goods of German origin from France, Belgium, Holland, and Switzerland were not required to make any payment under the German Reparation (Recovery) Act, but that firms importing the same class of goods direct from Germany were called upon to pay H.M. Customs 50 per cent., and in some cases 100 per cent. of their value, and on similar goods imported since May 12, 26 per cent., in addition to heavy charges for demurrage, rent, warehousing, &c.; and, in view of the undertaking by the German Government to pay to the Reparations Commission a sum representing 26 per cent. on all goods exported from Germany since May 1 last, was he prepared to recommend the House to suspend the operations of the German Reparation (Recovery) Act, 1921?

Sir P. Lloyd-Greame: In view of the acceptance by the German Government of the Reparation Settlement, under which they have agreed to repay to exporters of goods from Germany the levy of 26 per cent. imposed by that Settlement, the Board of Trade have issued an Order limiting the application of the German Reparation (Recovery) Act to goods first consigned from Germany. All exports from Germany will be liable to the levy, but in the case of direct exports to this country, the levy will be collected by the Commissioners of Customs and Excise. In the case of exports to countries which have not adopted similar legislation to our own, the levy will be collected by the German Government. The answer to the last part of the question is in the negative.

Traders' Difficulties

Mr. Briggs: Is the hon. Gentleman aware that traders are finding very great difficulty in getting their goods through the Customs even after they have made sworn declarations as to the date of contract, &c.? And is he aware that the usual thing is for the Customs to ask for a bond to be entered into for payment of the duty by the trader if he is called upon for it by the Customs, and may I ask if he could see his way to give some instructions whereby the traders' position may be more fairly and properly considered?

Sir P. Lloyd-Greame: I do not catch quite clearly the points put by my hon. Friend, but if he has any specific case that he would like to bring to my notice, I shall be very glad to consider it.

Mr. Galbraith asked the Financial Secretary to the Treasury what was the amount received in respect of the Act.

Mr. Young: The amount received up to the 2nd instant inclusive was £30,000.

Captain W. Benn: What was the total cost incurred in collecting on the revenue and on the trade?

Mr. Speaker: That question had better be placed on the Paper.

Recent Wills

Mr. S. Goodhall Cox, Ph.C., chemist and druggist, of 52, London Road, Leicester	£3,683
Mr. W. J. Wigg, of Chester, colour manufacturer ...	£27,613
Mr. J. Graham, Craggwood House, Horsforth (for 21 years with the Bradford Dyers' Association)	£8,894
Mr. J. S. Macarthur, paint manufacturer and oil merchant, Dunclutha, St. John's Road, Pollockshields, Glasgow	£104,655
Mr. F. W. Stedman, of Ashford, Kent, chemist...	£3,915

In connexion with their new ARTIFICIAL FERTILISER WORKS in South Africa, Cape Explosives Works, Ltd., state that they will rival in size the most important fertilising plants in Europe and America. In addition to superphosphate of various grades, special compound manures to suit the different crops and soils of the country will be manufactured on a large scale.

From Week to Week

Nine thousand tons of crude oil came into Swansea during the week-end in one cargo.

Dr. E. B. Maxted, who left this country in April for a three months' tour in the United States, is expected back in England about the end of this month.

Briton Ferry chemical works have closed down owing to lack of coal and the cessation of orders for acid from tin-plate works.

Mr. G. Rudd Thompson, of Newport, county analyst for Monmouthshire, has been elected the representative for Wales and Monmouthshire on the Council of the Institute of Chemistry.

During the course of the Spring Conference of the Textile Institute, held at Basle, the delegates VISITED THE FACTORIES of the Society of the Chemical Industry (Ciba) and the Sandoz Chemical Works.

Dr. M. O. Forster, F.R.S., the president of the Chemical Section of the British Association, which meets at Edinburgh in September, has selected as the subject of his Presidential Address "The Laboratory of the Living Organism."

Professor Einstein arrived at Liverpool on Wednesday and was met by a delegation from the University of Liverpool. He proceeded to Manchester, where he will lecture in German at the University, and will receive the degree of D.Sc.

Six presses were re-started at the Graigola Fuel Works, Swansea, during last week, but the outlook in the patent fuel industry still remains very uncertain, though the removal of the embargo on foreign coal may help to improve the situation.

Mr. JOHN HUNTER, who takes the place of Mr. Arturo Lopez on the directorate of the Lautaro Nitrate Co., has been in the service of the company for over 30 years out of its 33 years of existence, and has occupied the position of secretary for about 20 years.

Applications for the Ramsay Memorial Fellowship in Chemical Research must reach the secretary of the Ramsay Trustees, Dr. Walter Seton, at University College, London, by June 15. The value of the fellowship is £250 a year, together with £50 for the expense of research. Forms of application can be obtained from Dr. Seton.

A Treasury minute issued on Saturday gives formal effect to the decision, already announced by Mr. Chamberlain, to reduce from 50 to 26 per cent. the proportion of the value of imported German goods to be deducted under the Reparation (Recovery) Act. The new figure applies to goods imported on and after May 13.

Application is being made to the Board of Trade for a licence allowing the Welsh National Exhibition (Incorporated), which is to open an exhibition of trade manufactures and products, machinery and appliances at Cardiff next year, to be registered with limited liability without the addition of the word "limited" to its title.

At Swansea Chamber of Commerce on May 27 it was reported that the Government scheme regarding the granting of export credits now applied to PATENT FUEL, and that the latest conference having resulted in certain advantages being conceded, it was hoped the scheme would prove of benefit in the effort to re-establish trade.

A microscope equipped throughout with quartz lenses which are transparent to the ULTRA-VIOLET RAYS has been perfected by Mr. J. E. Barnard, Director of the Optical Department of the National Institute of Medical Research. It is claimed that the internal structure of micro-organisms is revealed by the use of this instrument.

Professor Coates, D.Sc., F.I.C., Professor of Chemistry at Swansea University College, addressed the South Wales Section of the Institute of Chemistry last week on hydrocyanic acid, describing in his paper the difficulties of making the anhydrous acid and also the problem of devising and organising a plant to manufacture the product in large quantities.

The Chilian Government is introducing a Bill to establish a State monopoly for the purchase and production of saltpetre, and for the direct sale of saltpetre to consumers. Another measure has been introduced empowering the President to prohibit, for a period not exceeding one year, the importation of goods he may consider unnecessary or not of first importance.

An outbreak of fire which recently occurred in the premises belonging to Wells & Company, chemical manufacturers, at Leith, caused considerable damage. The flames soon spread. The sheds in the yard, which were completely destroyed, contained a considerable quantity of marine glues and other chemicals. It is estimated that about £1,000 worth of stock was destroyed.

The King's Birthday Honours List published last week contained the names of Mr. Llewellyn S. Lloyd, assistant secretary to the Department of Scientific and Industrial Research since its formation, who becomes a C.B. and Mr. J. B. Harrison, the Director and Government analyst, Department of Science and Agriculture, Colony of British Guiana, who receives a Knighthood.

The University of Wales is to confer its honorary D.Sc. degree on Sir J. J. Dobbie, for long service to the University and high distinction as a chemist. Sir James Dobbie, while on the staff of the Bangor University College, took a leading part in the organisation of the Agricultural Science Department, and by means of extension lectures, demonstrations, &c., did much to develop the application of science to agriculture.

The next ordinary scientific meeting of the Chemical Society will be held on Thursday next at 8 p.m. at the Institution of Mechanical Engineers, Storey's Gate, Westminster, when Professor Benjamin Moore, F.R.S., will deliver the Hugo Müller Lecture entitled: "The Natural Photo-synthetic Processes on Land and in Sea and Air, and their Relation to the Origin and Preservation of Life upon the Earth."

Redditch Urban Council on Tuesday considered a report from the Electric Supply Committee upon the position at the electricity works having regard to the shortage of coal. A conference with the manufacturers had been held, and certain restrictions of current for power purposes had been found necessary. The Council agreed that every effort should be made to maintain the supply for power purposes, and decided to purchase an apparatus for spraying oil on coal with a view to improving the burning capacity of the fuel.

Mr. G. V. Parker, of the South Wales Basic Slag Co., Ltd., and managing director of the Slag Phosphate Co., spoke at the formal opening of the RECREATION GROUNDS in connexion with Messrs. Baldwin's Panteg Works, where a proportion of the basic slag and the Nauru phosphate will be ground to produce slag phosphate. The recreation grounds surround a club house, and comprise tennis courts, bowling greens, and cricket and football pitches. The club retains the whole-time services of a professional cricketer and a groundsman, the firm paying one-half of the cost.

A general meeting of the members of the Royal Institution was held on Monday, Sir James Crichton-Browne, treasurer and vice-president, in the chair. Miss G. Caton-Thompson, Sir John Collie, Mr. N. G. Hallett, Dr. H. R. Le Sueur, Mrs. Sidney Turner, Mr. J. Whitehead and Dr. Leonard Williams were elected members. The special thanks of the members were returned to Sir Humphry Davy Rolleston for his present of a safety lamp which was in the possession of Dr. John Davy, brother of Sir Humphry Davy, and to Sir David L. Salomons for his present of a privately printed life and study of the works of Breguet, the famous watchmaker, Arago's watch and two others of special interest, the first working aneroid, made by Vidi in 1857, and a series of models illustrating the development of the clock.

In a paper on the "Coefficient of Diffusion of Certain Saturated Solutions," delivered at a recent meeting of the Physical Society, Mr. B. W. Clack gave an account of experiments on the DIFFUSIVITY OF SATURATED SOLUTIONS of KCl, NaCl and KNO_3 at constant temperatures near 18°C., when the steady state of diffusion had been attained, employing a method similar to that previously used by the author. The solution under investigation was maintained at complete saturation by the presence of salt crystals in the diffusion vessel, the theory taking into account the change in volume of this salt as it dissolved, and an expression was obtained for the coefficient of diffusion at complete saturation, which depended on the rate of change in weight of the diffusion vessel with time. The experimental results were found to agree very closely with the values obtained by extrapolation from the results previously found for less concentrated solutions.

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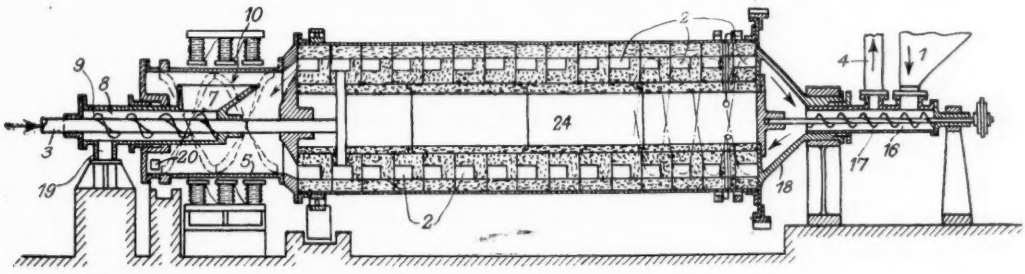
The apparatus is for reducing a liquid to a state of very fine division in a current of drying gas or other gas with which it reacts chemically. The liquid is led into a container which is mounted within a working chamber and rotated on its vertical axis at a high speed. A number of small openings are provided in its circumference through which the liquid is delivered by centrifugal force in a finely divided state. Alternatively the container may be provided with straight or curved radial arms which form or are fitted with nozzles through which the liquid is sprayed. Each nozzle may contain a radial pipe through which air or gas is delivered to assist the spraying of the liquid.

162,682. Extraction of Metals from Solutions or Separation of Metals, Process for. W. J. Browning, Minas de Rio Tinto, Huelva, Spain. Application date, July 31, 1919.

A solution of a metallic salt is treated with elementary sulphur and sulphuretted hydrogen, produced by burning, calcining, or distilling sulphur bearing minerals such as pyrites or cupriferous pyrites in the presence of steam. This results in the precipitation of sulphides of metals such as copper and the residual gas contains sulphur dioxide. This gas is passed continuously over incandescent carbon with the addition of air to reduce the proportion of sulphur dioxide to 7 per cent. The carbon is maintained incandescent by the reaction and the gaseous product contains elementary sulphur and sulphuretted hydrogen, which may then be used in the first part of the process.



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162,684. Coal and Similar Carbonaceous Substances, Distillation of. Low Temperature Carbonisation, Ltd., T. M. Davidson and H. L. Armstrong, 14, Cockspur Street, London, S.W. Application dates, August 21 and October 14, 1919.

A vertical retort of oblong cross section is provided with a cooling chamber immediately below, having one end wall vertical while the other extends in a curve forming one quarter of a circle, from the bottom of the retort at one end to the bottom of the vertical wall of the cooling chamber at the other end. This curved wall serves to guide the charge outwards through a discharge door in the lower part of the vertical wall. The retort and the cooling chamber are separated by a horizontal door of the rotary type. The cooling chamber is provided with water jackets for its side walls and the steam generated may be passed through a superheater in a flue in the setting. The cooling chambers of adjacent retorts are separated by spaces which form flues for the waste gas from the retort heating flues.

162,687. Colouring Matters, Production of. Sir W. J. Pope, Holmesdale, Brooklands Avenue, Cambridge, and Scottish Dyes, Ltd., Murrell Hill Works, Carlisle. Application date, September 27, 1919.

The process is for the manufacture of N-dihydro-1 : 2 : 1′: 2′-anthraquinoneazine and its derivatives and the object is to obtain a better yield than is obtained by the usual process in which 2-amino-anthraquinone is treated with fused caustic potash with or without an oxidising agent and the resulting product dissolved and then subjected to atmospheric oxidation. This process is now modified by causing the reaction to take place in the presence of a salt of an organic acid which is miscible in a fused state with the alkali. Examples are given in which potassium formate and potassium acetate are employed as the organic salt, either alone or together. The reaction may be modified by the presence of water or other inert solid or liquid diluent for the purpose of lowering the fusing point of the mixture. The yield of the final product may be still further improved by the addition of a small quantity of an oxidising agent such as potassium chlorate.

162,718. Treating Poor Iron Ore Containing Weakly Magnetic or Non-Magnetic Oxygen Compounds of Iron, Process and Apparatus for. R. Storen, Kongsberg, Norway, and R. Johanson, Otta, Norway. Application date, December 29, 1919.

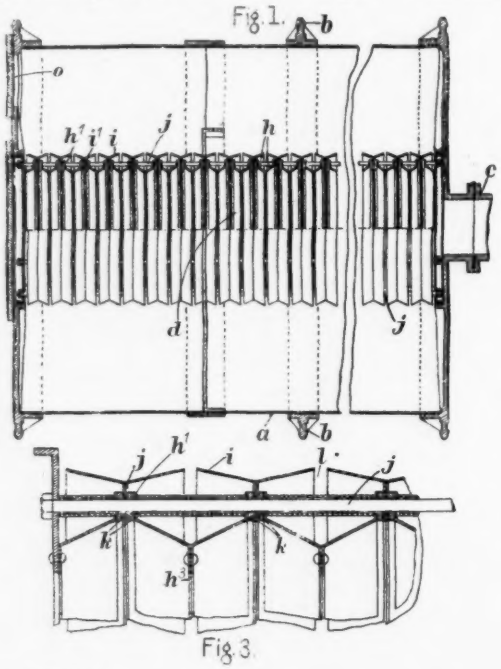
Iron ore containing oxides which are non-magnetic or only slightly magnetic is prepared for magnetic separation by a partial or complete reduction to magnetic oxides. This reduction is preferably effected at about 400° C. by means of hydrogen obtained electrolytically. The ore is supplied from a hopper 1 to a stationary feed passage 16 through which it is conveyed by a screw 17 carried by the rotating furnace. The ore passes through a conical portion 18 to the channels 2, which are arranged in the form of a double helix in the annular refractory lining of the furnace. The ore is gradually fed through the channels 2 by the rotation of the furnace. Hydrogen is passed through the channels 2 in counter-current to the ore and the resulting water vapour is discharged through an outlet pipe 4. The reduced ore passes into a cylinder 5 which rotates with the furnace and is partly enclosed by a system of radial electro magnets 6. The material is conveyed forward by helical ribs 10 on the inner surface of the cylinder 5 and is subjected to the magnetic field which decreases to zero at the top. At this point the magnetic material drops from the inner surface of the cylinder into a stationary receiver 7, from which it passes to an axial passage 8. The pipe 3 carries a helical rib 9, which conveys the material forward to the outlet 19. The non-magnetic material is discharged through the outlet 20. The furnace is heated internally by means of the central chamber 24. In a modification the magnetic material is separated within the furnace by means of a movable system of magnets.

162,727. Pitch, Method of Treating. F. J. Commin, 5, Victoria Street, Westminster, S.W.1. Application date, January 2, 1920.

The object is to obtain pitch in an extremely fine state of division. Coarsely ground pitch is treated in a ball mill with an equal weight of water containing in solution about 2 per cent. of a peptising agent such as casein dissolved in dilute alkali or sodium rosinate. The fine particles produced by grinding are thus prevented from adhering or are deflocculated, and the product may be dispersed in water. The resulting product may be used in the manufacture of cellulose fibre compositions containing pitch.

162,769. CARBONISING SAWDUST AND OTHER FINELY-DIVIDED MATERIAL, AND TREATING GASES AND VAPOURS WITH FINELY-DIVIDED SUBSTANCES, APPARATUS FOR. P. Poore, 1-4, Paternoster Row, London, E.C.4. Application date, February 2, 1920.

Sawdust is distilled in a casing *a* which is supported on rollers and rotated by means of a chain wheel *b*. The flue *d* is mounted axially within the casing and communicates with an outlet fitting *c*. The flue *d* is constructed of a number of annular metal plates *h*, *i* having annular flat flanges, h^1, h^3 and i^1, each plate having a conical peripheral part. The plates are mounted on a number of parallel longitudinal rods *j* passing through the annular flanges h^1 which are spaced apart by washers *k*. The flue *d* is thus made up of a number of annular pockets having circular slots *l*. The raw material is charged through the door *o* and the casing *a* is continuously or



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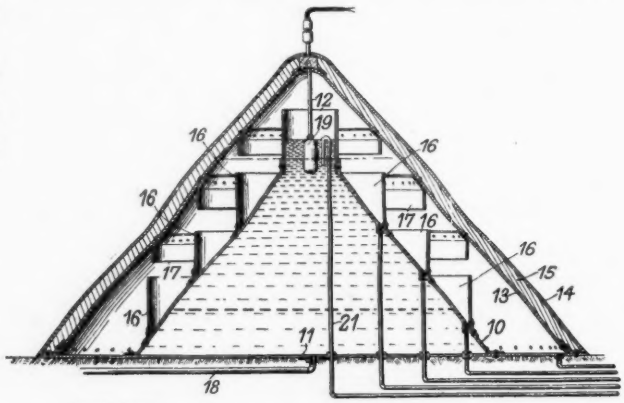
periodically rotated while in the heating furnace. The vapour produced passes through the slots *l* into the annular pockets and thence through the spaces between the flanges h^1, i^1 to the interior of the flue and to the outlet *c*. Any material which passes into the pockets at the top will pass out again through the slots *l* during rotation. Similarly any material passing into the interior of the flue *d* is returned during rotation. The vapour is thereby afforded a free passage into and through the flue *d*. The apparatus may be slightly varied to render it suitable for treating finely divided substances with gases and vapours. In this case, transverse partitions are provided alternately in the flue *d* and in the space surrounding it, so that the gas or vapour is forced to pass forward and backward through the walls of the flue *d*.

162,873. CRUDE OIL REFINING PROCESS AND APPARATUS. J. G. P. Evans, Handley, Tex., U.S.A. Application date, March 9, 1920.

Oil is distilled by heat, applied to the layer at the top, the heat passing downwards through the body of the oil by conduction only without circulation of the oil. High gravity gasoline may thus be obtained with low temperature. A truncated conical vat, 10, is provided with a base, 11, which extends outwards and carries the lower end of the conical jacket 13, 14, containing heat insulating material 15. Collecting troughs, 16, are arranged around the conical wall of the vat at different levels, and each is provided with an annular drip flange, 17, depending from the shell 13. Oil is supplied at the bottom by the pipe 18 and an electric heater, 19, is provided in the lower part of the flue 12 just below the surface of the oil. The level is kept constant by an overflow pipe, 21. The temperature varies from 560°F. at the top to 60°F. at the bottom, and the vapours which are generated at different temperatures pass upward through the hotter oil, and are thus superheated and expanded. The mixed vapours pass downwards through the annular space surrounding the vat, and are condensed in the same order in which they were formed. The condensates are collected in the troughs 16 and are drawn off through



162,873

pipes, 23. Any vapour condensing on the surface 13 is diverted by the flanges 17 into the proper troughs. All the heat liberated from the condensed vapours is thus utilised in assisting the heating of the oil under treatment.

NOTE.—The following specifications which are now accepted were abstracted in THE CHEMICAL AGE when they became open to inspection under the International Convention: 136,837 (Soc. l'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude), relating to separation of the constituents of liquefied gaseous mixtures, *see* Vol. II., p. 210; 138,116 (Deutsche Celluloid Fabrik), relating to cellulose compounds, *see* Vol. II., p. 385; 138,622 (T. A. Eklund), relating to recovery of tin from waste products, *see* Vol. II., p. 447; 140,051 (H. Sasa), relating to phthalic anhydride, *see* Vol. II., p. 537; 145,781 (F. J. Collin Akt.-Ges. zur Verwertung von Brennstoffen und Metallen), relating to discharge of ammonium sulphate from saturators, *see* Vol. III., p. 294; 148,998 (M. Arndt), relating to gas analysing apparatus, *see* Vol. III., p. 321.

International Specifications not yet Accepted

161,560. TREATING ORES. Trent Process Corporation, 1770, U Street, Washington, D.C., U.S.A. (Assignees of W. E. Trent, 908, G Street, Washington, D.C., U.S.A.) International Convention date, April 9, 1920.

Ores, froth concentrates, flue dust or the like are mixed with oil and a powdered carbonaceous substance, such as coal. The mixture is agitated, and the gangue and impurities in the ore and coal are thereby separated out from the metallic compounds, coal and oil. The latter mixture thus contains fuel which is available for smelting purposes.

161,564. CELLULOSE BUTYRATES AND PLASTIC COMPOSITIONS. A. D. Little, Inc., Charles River Road, Cambridge, Mass., U.S.A. (Assignees of G. J. Esselen, Swampscott, Mass., U.S.A., and H. S. Mark, South Boston, Mass., U.S.A.) International Convention date, April 10, 1920.

Cellulose is subjected to a preliminary treatment with a catalyst, such as sulphuric acid, in the presence of a solvent, such as butyric acid or acetic acid, preferably containing a small proportion of water. If butyric acid is used, a solvent such as methyl, ethyl or butyl alcohol, acetone, diacetone alcohol, or ethyl acetate is also added. The cellulose is then treated with butyric anhydride in the presence of butyric acid and sulphuric acid until the product has the desired solubility in alcohol-benzol. The resulting product is soluble in alcohol benzol, acetylene tetrachloride, acetone, ethyl acetate, carbolic acid, hot alcohol and benzol, alcohol-carbon tetrachloride, and hot solvent naphtha. It may be used for making plastic compositions, films, artificial silk, lacquers, &c.

161,581. SULPHUR DIOXIDE. Rhenania Verein Chemischer Fabriken Akt.-Ges. (formerly Verein Chemischer Fabriken Mannheim), Wohlgelegen, Mannheim, Germany. International Convention date, April 14, 1920.

An alkaline earth sulphate is heated with a sulphide of a heavy metal and iron oxide, to obtain sulphur dioxide. In one example, 5 parts of gypsum, 1 part of pyrites, and 3 parts of iron oxide are heated to 900°C.–950°C., and about 8 per cent. of the sulphur is obtained in the free state.

LATEST NOTIFICATIONS

163,973. Combined furnace drying kilns for ceramic products and the like. Sturm, H. May 25, 1920.

163,975. Method of manufacturing aluminium chloride. Aluminium Co. of America. May 26, 1920.

163,980. Manufacture of formaldehyde. Barrett Co. May 26, 1920.

163,721. Process for eliminating oil vapour from bearings. Akt.-Ges. Brown, Bouverie et Cie. May 27, 1920.

163,703. Production of hydrogen from hydrocarbons. Nitrogen Corporation. May 25, 1920.

163,706. Process and apparatus for the continuous production of sulphates. Soc. Anon. De Produits Chimiques Etablissements Maletra. May 25, 1920.

164,001. Process for the treatment of the residuary ammonium chloride lyes derived from the manufacture of sodium carbonate by the ammonia process. Elektrizitätswerk Lonza. May 29, 1920.

164,002. Manufacture of methyl sulphites of secondary aromatic-aliphatic amines. Fabwerke Vorm. Meister, Lucius & Brüning. May 31, 1920.

Specifications Accepted, with Date of Application

137,831 and 139,171. Cellulose, Manufacture of. C. A. Braun. August 5, 1916, and May 29, 1918. 139,171 addition to 137,831.

140,775. Ores and the like, Apparatus for use in concentrating. G. Grondal. March 22, 1920.

147,633. Fuel gases, Process of recovering by-products from. F. J. Collin Akt.-Ges zur Verwertung von Brennstoffen und Metallen. March 3, 1919.

148,210. Zinc extracting furnaces with vertical retorts. R. von Zelewski. March 28, 1916.

148,564. Hydrogen or oxygen, Apparatus for the purification of. G. F. Jaubert. October 12, 1918.

159,850. Crucible furnaces, Apparatus for charging or discharging. E. E. Brosius. March 3, 1920.

163,343. Carbonisation and distillation of moist carbonaceous materials, Apparatus for use in. H. N. McLeod. March 14, 1919.

163,347. Distillation or cracking of hydrocarbon oils. C. Dalley. (*T. J. Greenway.*) July 21, 1919.

163,352. Conversion of fatty acids or oils, or fats containing free fatty acids, into glycerides, Process for. E. R. Bolton and E. J. Lush. September 30, 1919.

163,359. Manures. C. E. de Wolf and H. E. Fry. November 14, 1919.

163,363. Petroleum or the like, Treatment of. C. V. Illing and J. Kelly. November 18, 1919.

163,417. Manure and method of manufacturing same. E. H. Sams. August 30, 1920.

163,513. Gas-producers. D. Williams, W. E. Francis and Bynea Steel Works, Ltd. March 1, 1920.

163,561. Iron from iron ores, Process for the manufacture of. S. J. Vermaes and Syndicaat "Electro-Staal." March 30, 1920.

163,656. Asphalt from petroleum or the like, Production of. C. V. Illing and J. Kelly. November 18, 1919.

Applications for Patents

Aymard, M. F. L. A. Treatment of silica-bearing ores. 14,946. May 30.

Benjamin, C. S. Method for purification of hydrocarbons. 15,080. May 31. (United States, June 4, 1920).

Charlesworth, A. E. Dyeing processes. 15,482. June 4.

Cunningham, C. G. Production of water gas. 15,001. May 30.

Evershed, H. R., & Gilsham, J. Process for manufacture of sulphate of lead. 15,078. May 31.

Farbwerke vorm. Meister, Lucius, & Brüning. Manufacture of methylsulphites of secondary aromatic-aliphatic amines. 14,986. May 30. (Germany, May 31, 1920).

Jourdan, F. Ammonia-soda process. 15,426. June 3. (Italy, June 3, 1920).

Klee, F. H. M. Apparatus for determining flash points of oils, &c. 15,458. June 3.

Krebitz, P. Process of separating saponaceous matter from lime sludge. 15,428. June 3.

Macpherson, D. H. Process for preparation of pigments from titaniferous laterites. 15,308. June 2.

Mann, Egerton & Co., Ltd. Plant for generation and supply of gas from liquid hydrocarbons. 15,359. June 2.

Möller, E. Apparatus for separating suspended bodies from gaseous fluids, &c. 15,118. May 31. (Germany, July 31, 1914).

Money, G. J. Chemical fire-extinguishers. 15,526. June 4.

Peufaillit, L. Process for industrially preparing derivatives of bornyle for preparing synthetic camphor. 15,441. June 3. (Belgium, January 10).

Sturgeon, R. A. Centrifugal separators. 15,038. May 31.

Techno-Chemical Laboratories, Ltd. Manufacture of china clay. 14,992. May 30.

Turner, W. L. Production of carbon-free ferromolybdenum. 15,179. June 1.

Wright, Sir J. R., & R. B. Production of ammonium salts and coloured pigments. 15,023. May 31.

Patents Court Cases

NOTICE has been given of an application by The British Alizarine Co., Ltd., Westinghouse Road, Trafford Park, Manchester, for the grant of a license under Rule 7 of the Patents (Treaty of Peace) Rules, 1920, in respect of Patent 21,710/1911 (J. Y. Johnson—Badische Anilin & Soda Fabrik), relating to the manufacture of aminoanthraquinones. Any notice of opposition must be given by June 30, 1921.

Notice has also been given of applications for the following patents to be indorsed "Licences of Right," under Sect. 24 of the Patents and Designs Acts, 1907 and 1919: 7,597/1913 (E. Collett), relating to concentration of nitric acid; 10,351/1914 (E. C. R. Marks—E. I. du Pont de Nemours Powder Co.), relating to apparatus for recovering solvents. Any notice of opposition must be given by July 8, 1921.

Disinfectants for the Near East

THE Ministry of Communications, Belgrade, is inviting tenders to be submitted by June 22 for the supply of the following disinfecting materials: 40,000 kilos of pink chloride powder (without iron supplements and without free chlorohydrogen acid); 700,000 kilos of creosote (with the following specifications: minimum 5 per cent. of phenol, cresol and their "homologues"; it should be liquid at 15°C.). In the offers, which must bear a 10 dinars duty stamp, prices must be stated all charges paid Belgrade or port. They must be enclosed in a sealed envelope and addressed "Ekonomsko Odelenje, Ministarstva Saobracaja." On the envelope should be written "Ponuda za licitaciju pinkhlorida i creozota." A deposit of 10 per cent. by S.C.S. subjects and 20 per cent. by foreigners must be made before or on the date of tendering. It is desirable for United Kingdom firms interested in Serb-Croat-Slovene State contracts to be represented in that Kingdom. The Department of Overseas Trade is prepared to assist in the appointment of agents.

Royal Society

AT a meeting of the Royal Society to be held on Thursday next, the following Papers are expected to be read: H. B. Dixon, F.R.S., Colin Cambpell, D.Sc., and A. Parker, D.Sc., on "The Velocity of Sound in Gases at High Temperatures, and the Ratio of the Specific Heats"; J. R. Partington, D.Sc. "The Ratio of the Specific Heats of Air and of Carbon Di oxide" (communicated by Dr. J. H. Harker, F.R.S.); A. B. Wood, D.Sc., and F. B. Young, D.Sc., on "Light Body Hydrophones and the Directional Properties of Microphones" (communicated by Sir W. Bragg, F.R.S.); A. B. Wood, D.Sc., and F. B. Young, D.Sc., on "The Acoustic Disturbances Produced by Small Bodies in Plane Waves transmitted through Water, with Special Reference to the Single Plate Direction Finder" (communicated by Sir W. Bragg, F.R.S.); M. A. Giblett, "Some Problems connected with Evaporation from large Expanses of Water" (communicated by Dr. G. C. Simpson, F.R.S.); F. C. Toy, "The Photographic Efficiency of Heterogeneous Light" (communicated by Prof. A. W. Porter, F.R.S.).

Calcium Carbonate in Canada

A COMPANY has been formed with a capital of $50,000 to develop washed calcium carbonate from deposits in Kane Valley, near Merritt, British Columbia, where a finishing mill is to be erected. This product, known commercially as whiting, is at present imported, principally from England and Italy, for use in Canada and the United States.

Monthly Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, *and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The weekly report contains only commodities whose values are at the time of particular interest or of a fluctuating nature. A more complete report and list are published once a month. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.*

British Market Report

THURSDAY, June 9.

The situation in respect to the coal strike shows signs of an improvement and there are hopes that a settlement may be effected in the textile industry without a prolonged stoppage. In the meantime, trade remains paralysed and business is almost non-existent. Changes in price are few and far between, and in the absence of business prices can only be regarded as nominal.

There is no outstanding feature in the export trade during the week.

General Chemicals

ACETONE.—Unchanged.

ACID ACETIC.—Price nominally unchanged but inclined to be firm.

ACID CITRIC remains very firm and only limited stocks are to be found.

ACID FORMIC.—Unchanged.

ACID LACTIC.—The enquiry has diminished in volume. Price unaltered.

ACID TARTARIC is freely offered by both first and second hands, but little business is reported.

BARIUM CHLORIDE is still offered at low prices from abroad, but no transactions of importance are indicated.

BLEACHING POWDER remains lifeless.

COPPER SULPHATE is only going very slowly in spite of the greater enquiry and the improved exchange position.

FORMALDEHYDE.—The fall in price has been arrested and stocks are firmly held.

LEAD ACETATE remains a nominal market.

LEAD NITRATE.—No alteration is reported.

POTASH BICHROMATE.—The tendency remains in sellers' favour. Considerable quantities are on offer and there is little business.

POTASH CARBONATE is inclined to be easier in the absence of orders.

POTASH CAUSTIC.—The market is overstocked. The tendency is lower and buyers are difficult to find.

POTASH PERMANGANATE.—No change.

POTASH PRUSSIATE maintains its recent advance.

SODA ACETATE.—Featureless.

SODA BICHROMATE is practically unsaleable. There are no export orders and the home trade is dead.

SODA CAUSTIC.—No improvement in the market is indicated.

SODA HYPOSULPHITE remains dull.

SODA NITRITE is in poor demand and buying is of the hand-to-mouth variety.

SODA PHOSPHATE.—Unchanged.

SODA PRUSSIATE is decidedly firmer in price and has been in better enquiry for export.

SODA SULPHIDE.—There has been some enquiry for export but business has not yet materialised.

Coal Tar Intermediates

There has been slightly more activity this week, especially on export account, although up to the time of writing this report very little extra business has been reported.

ALPHA NAPHTHYLAMINE is quietly steady.

ANILINE OIL AND SALT.—There has been some small enquiry on export account, but it is difficult to trace any actual business.

BETA NAPHTHOL remains quiet and easy.

BETA NAPHTHYLAMINE has been in request and some small business is reported.

DIMETHYLANILINE is in only quiet demand and price is without change.

NAPHTHIONIC ACID is quietly steady.

NITRO BENZOL continues in quietly steady demand, without change in value.

PARANITRANILINE.—There is no change.

RESORCIN is in small request at last-quoted figures.

SALICYLIC ACID remains very firm with an upward tendency.

Coal Tar Products

Owing to the continued coal strike, supplies of all coal tar products are becoming increasingly difficult to obtain, and this is having the effect of increasing the price of one or two articles.

90's BENZOL.—In spite of the advised reduction in price, we find the price of Benzol to be still maintained. Sellers are asking 3s. on rail in the Midlands, and an equivalent figure has been offered for London delivery without supplies being forthcoming.

PURE BENZOL is also scarce, and is nominally quoted at 2s. 10d. to 3s. on rails in the North and 3s. to 3s. 2d. in the South.

CREOSOTE OIL is somewhat scarce for prompt delivery, and is quoted at 8½d. in the North, while in the South the price is in the region of 10d.

CRESYLIC ACID remains weak, the price for Pale 97/99 per cent. being 2s. 3d. on rails, and for the Dark quality 1s. 11d. to 2s.

SOLVENT NAPHTHA is scarce and is quoted at 2s. 6d. on rails.

HEAVY NAPHTHA is worth 2s. 4d.

NAPHTHALENE is weak, and is quoted from £9 to £12 per ton for Crude qualities, the price for Refined being from £18 to £23.

PITCH.—The market has been more active, and a number of small transactions has taken place in parcels for prompt shipment at from 65s. to 70s. f.o.b. East Coast, and 70s. f.o.b. London, while for forward delivery as high as 75s. f.o.b. London has been paid.

Sulphate of Ammonia

The home trade price has been reduced to £18 10s. per ton, and the market for export is very irregular.

French Market Report

This market continues very quiet, and quotations are more or less nominal. It is thought, however, that stocks are becoming much lighter, and that any improvement in the demand will result in certain prices rising.

ACETONE is quoted at 525 frs.
ACID ACETATE, 80 per cent., 350 frs.
ACID CITRIC, 15 frs. per kilo.
ACID OXALIC, 490 frs.
ACID TARTARIC, 10 frs. per kilo.
AMMONIUM CARBONATE, 220 frs.
AMMONIUM PHOSPHATE, 480 frs.
BARIUM CHLORIDE, 90 frs.
CALCIUM CHLORIDE, 48 frs.
CHROME ALUM, 240 frs.
COPPER SULPHATE, 155 frs.
FORMALDEHYDE, 40 per cent., 6 frs. per kilo.
LEAD ACETATE, white, 250 frs.
LITHOPONE, 125 frs.
POTASSIUM BICHROMATE, 430 frs.
POTASSIUM META BISULPHITE, 600 frs.
POTASSIUM PERMANGANATE, 11 frs. per kilo.
POTASSIUM YELLOW PRUSSIATE, 630 frs.
SODIUM ARSENIATE, 58 per cent., 230 frs.
SODIUM BICARBONATE, 95 frs.
SODIUM BICHROMATE, 300 frs.
SODIUM CAUSTIC, 76 per cent., 115 frs.
SODIUM PRUSSIATE, 390 frs.
SODIUM NITRITE, 330 frs.
SODIUM PHOSPHATE, 150 frs.
SODIUM SULPHITE, 150 frs.
SODIUM SULPHIDE, crystals, 60 frs.
SODIUM SULPHIDE, concentrated, 100 frs.

All the above quotations are per 100 kilo unless otherwise stated.

German Market Report

Trade continues to be very slack, especially on export account, and prices in the main still show a tendency to droop.

ALUM is weak at 2.15 marks.

ALUMINA SULPHATE, 14/15 per cent., 2.25 marks.

ARSENIC, white, 10 marks.

COPPER SULPHATE is in slightly better demand at 6.50 marks.

CHROME ALUM, 5 marks.

FORMALDEHYDE, 40 per cent., 25 marks.

HYDROGEN PEROXIDE, 30 per cent., 33 marks.

POTASSIUM BROMIDE, 18.50 marks.

POTASSIUM CYANIDE, 28 marks.

POTASSIUM PERMANGANATE, 29 marks.

SODIUM BROMIDE, 20 marks.

SODIUM SULPHIDE, Crystals, 2.50 marks.

SODIUM SULPHIDE, Concentrated, 5 marks.

All the above quotations are per kilo.

Current Prices

Chemicals

	per	£	s.	d.		£	s.	d.
Acetic anhydride	lb.	0	2	3	to	0	2	6
Acetone oil	ton	95	0	0	to	100	0	0
Acetone, pure	ton	105	0	0	to	110	0	0
Acid, Acetic, glacial, 99-100%	ton	70	0	0	to	72	0	0
Acetic, 80% pure	ton	53	0	0	to	54	0	0
Arsenic	ton	100	0	0	to	105	0	0
Boric, cryst	ton	69	0	0	to	70	0	0
Carbolic, cryst. 39-40%	lb.	0	0	6	to	0	0	6½
Citric	lb.	0	2	7	to	0	2	9
Formic, 80%	ton	77	0	0	to	80	0	0
Gallic, pure	lb.	0	4	0	to	0	4	3
Hydrofluoric	lb.	0	0	8½	to	0	0	9
Lactic, 50 vol.	ton	37	10	0	to	40	0	0
Lactic, 60 vol.	ton	42	10	0	to	45	0	0
Nitric, 80 Tw.	ton	41	0	0	to	44	0	0
Oxalic	lb.	0	0	10	to	0	0	11
Phosphoric, 1.5	ton	55	0	0	to	57	0	0
Pyrogallic, cryst	lb.	0	7	9	to	0	8	0
Salicylic, Technical	lb.	0	1	0	to	0	1	2
Salicylic, B.P.	lb.	0	1	4	to	0	1	6
Sulphuric, 92-93%	ton	8	10	0	to	8	15	0
Tannic, commercial	lb.	0	3	6	to	0	3	9
Tartaric	lb.	0	1	9	to	0	1	10
Alum, lump	ton	18	0	0	to	18	10	0
Alum, chrome	ton	45	0	0	to	50	0	0
Alumino ferric	ton	9	0	0	to	9	10	0
Aluminium, sulphate, 14-15%	ton	15	0	0	to	16	0	0
Aluminium, sulphate, 17-18%	ton	18	0	0	to	19	0	0
Ammonia, anhydrous	lb.	0	2	2	to	0	2	4
Ammonia, .880	ton	43	0	0	to	45	0	0
Ammonia, .920	ton	30	0	0	to	32	10	0
Ammonia, carbonate	lb.	0	0	4	to	—		
Ammonia, chloride	ton	65	0	0	to	70	0	0
Ammonia, muriate (galvanisers)	ton	50	0	0	to	52	0	0
Ammonia, nitrate	ton	55	0	0	to	60	0	0
Ammonia, phosphate	ton	95	0	0	to	100	0	0
Ammonia, sulphocyanide	lb.	0	3	0	to	0	3	0
Amyl acetate	ton	420	0	0	to	425	0	3
Arsenic, white, powdered	ton	52	0	0	to	55	0	0
Barium, carbonate, 92-94%	ton	12	10	0	to	13	0	0
Barium, chlorate	lb.	0	0	11	to	0	1	0
Chloride	ton	20	0	0	to	21	0	0
Nitrate	ton	50	0	0	to	52	0	0
Barium Sulphate, blanc fixe, dry	ton	30	0	0	to	31	0	0
Sulphate, blanc fixe, pulp	ton	16	10	0	to	17	0	0
Sulphocyanide, 95%	lb.	0	1	6	to	0	1	0
Bleaching powder, 35-37%	ton	20	0	0	to	21	0	0
Borax crystals	ton	34	0	0	to	36	0	0
Calcium acetate, Brown	ton	12	0	0	to	13	0	0
,, **Grey**	ton	19	0	0	to	21	0	0
Calcium Carbide	ton	29	0	0	to	30	0	0
Chloride	ton	12	10	0	to	13	0	0
Carbon bisulphide	ton	65	0	0	to	67	0	0
Casein, technical	ton	90	0	0	to	92	0	0
Cerium oxalate	lb.	0	3	9	to	0	4	0
Chromium acetate	lb.	0	1	2	to	0	1	4
Cobalt acetate	lb.	0	11	6	to	0	12	6
Oxide, black	lb.	0	16	0	to	—		
Copper chloride	lb.	0	1	3	to	0	1	6
Sulphate	ton	35	0	0	to	37	0	0
Cream Tartar, 98-100%	ton	130	0	0	to	135	0	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde 40% vol.	ton	103	0	0	to	105	0	0
Formusol (Rongalite)	lb.	0	4	9	to	0	5	1
Glauber salts, commercial	ton	6	0	0	to	7	0	0
Glycerine, crude	ton	70	0	0	to	72	10	0
Hydrogen peroxide, 12 vols.	gal.	0	2	8	to	0	2	9
Iron perchloride	ton	45	0	0	to	50	0	0
Iron sulphate (Copperas)	ton	4	0	0	to	4	5	0
Lead acetate, white	ton	50	0	0	to	52	0	0
Carbonate (White Lead)	ton	43	0	0	to	46	0	0
Nitrate	ton	55	0	0	to	57	0	0
Litharge	ton	38	10	0	to	40	0	0
Lithopone, 30%	ton	30	0	0	to	32	10	0
Magnesium chloride	ton	18	0	0	to	19	0	0
Carbonate, light	cwt.	2	15	0	to	3	0	0
Sulphate (Epsom salts commercial)	ton	10	10	0	to	11	10	0
Sulphate (Druggists')	ton	18	10	0	to	19	10	0
Manganese, Borate	ton	70	0	0	to	75	0	0
Sulphate	ton	75	0	0	to	78	0	0
Methyl acetone	ton	95	0	0	to	100	0	0
Alcohol, 1% acetone	ton	145	0	0	to	150	0	0
Nickel sulphate, single salt	ton	60	0	0	to	62	0	0
Nickel ammonium sulphate, double salt	ton	62	0	0	to	64	0	0
Potash, Caustic	ton	42	0	0	to	45	0	0
Potassium bichromate	lb.	0	0	9½	to	—		
Carbonate, 90%	ton	50	0	0	to	55	0	0
Chloride	ton	38	0	0	to	40	0	0
Chlorate	lb.	0	0	8½	to	0	0	9
Meta bisulphite, 50-52%	ton	130	0	0	to	140	0	0
Nitrate, refined	ton	50	0	0	to	52	0	0
Permanganate	lb.	0	2	0	to	0	2	3
Prussiate, red	lb.	0	2	6	to	0	2	9
Prussiate, yellow	lb.	0	1	6	to	0	1	7
Sulphate, 90%	ton	31	0	0	to	33	0	0
Salammoniac, firsts	cwt	3	15	0	to	—		
Seconds	cwt	3	10	0	to	—		
Sodium acetate	ton	35	0	0	to	37	10	0
Arsenate, 45%	ton	60	0	0	to	62	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	7½	to	0	0	8
Bisulphite, 60-62%	ton	35	0	0	to	37	10	0
Chlorate	lb.	0	0	5½	to	0	0	5½
Caustic, 70%	ton	24	0	0	to	24	10	0
Caustic, 76%	ton	25	0	0	to	25	10	0
Hydrosulphite, powder, 85%	lb.	0	2	3	to	0	2	6
Hyposulphite, commercial	ton	22	0	0	to	24	0	0
Nitrite, 96-98%	ton	48	0	0	to	50	0	0
Phosphate, crystal	ton	25	0	0	to	27	0	0
Perborate	lb.	0	1	9	to	0	2	0
Prussiate	lb.	0	0	8	to	0	0	8½
Sodium Sulphide, crystals	ton	19	0	0	to	20	0	0
Sulphide, solid, 60-62%	ton	26	0	0	to	30	0	0
Sulphite, cryst	ton	15	0	0	to	16	0	0
Strontium carbonate	ton	85	0	0	to	90	0	0
Strontium Nitrate	ton	84	0	0	to	90	0	0
Strontium Sulphate, white	ton	8	10	0	to	10	0	0
Sulphur chloride	ton	42	0	0	to	44	10	0
Sulphur, Flowers	ton	19	0	0	to	19	10	0
Roll	ton	19	0	0	to	19	10	0
Tartar emetic	lb.	0	2	3	to	0	2	6
Tin perchloride, 33%	lb	0	2	6	to	0	2	7
Tin Perchloride, solid	lb.	0	3	0	to	0	3	3
Protochloride (tin crystals)	lb	0	1	8	to	0	1	9
Zinc chloride, 102 Tw.	ton	22	0	0	to	23	10	0
Chloride, solid, 96-98%	ton	60	0	0	to	65	0	0
Oxide, 99%	ton	45	0	0	to	47	10	0
Dust, 90%	ton	90	0	0	to	92	10	0
Sulphate	ton	21	10	0	to	23	10	0

Coal Tar Intermediates, &c.

Alphanaphthol, crude	lb.	0	4	0	to	0	4	3
Alphanaphthol, refined	lb.	0	4	6	to	0	4	9
Alphanaphthylamine	lb.	0	3	0	to	0	3	3
Aniline oil, drums extra	lb.	0	1	7	to	0	1	8
Aniline salts	lb.	0	1	8	to	0	1	10
Anthracene, 85-90%	lb.		—		to	—		
Benzaldehyde (free of chlorine)	lb.	0	4	9	to	0	5	0
Benzidine, base	lb.	0	8	6	to	0	9	0
Benzidine, sulphate	lb.	0	9	0	to	0	9	6
Benzoic acid	lb.	0	2	3	to	0	2	6
Benzoate of soda	lb.	0	2	3	to	0	2	6
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol benzoate	lb.	0	8	0	to	0	8	6
Betanaphthol	lb.	0	2	9	to	0	3	0
Betanaphthylamine, technical	lb.	0	9	6	to	0	10	0
Croceine Acid, 100% basis	lb	0	5	0	to	0	6	3
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	6	9	to	0	7	6
Dinitrobenzol	lb.	0	1	5	to	0	1	6
Dinitrochlorbenzol	lb.	0	1	5	to	0	1	6

	per	£	s.	d.		£	s.	d.
Dinitronaphthaline	lb.	0	1	6	to	0	1	9
Dinitrotoluol	lb.	0	1	8	to	0	1	9
Dinitrophenol	lb.	0	3	0	to	0	3	3
Dimethylaniline	lb.	0	4	0	to	0	4	3
Diphenylamine	lb	0	4	6	to	0	4	9
H-Acid	lb.	0	10	0	to	0	10	6
Metaphenylenediamine	lb.	0	5	9	to	0	6	6
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	7	6	to	0	8	0
Monosulphonic Acid (2:7)	lb.	0	7	6	to	0	8	0
Naphthienic acid, crude	lb.	0	4	0	to	0	4	3
Naphthionate of Soda	lb.	0	4	3	to	0	4	6
Naphthylamin-di-sulphonic-acid	lb.	0	5	0	to	0	5	6
Nitronaphthalene	lb.	0	1	5	to	0	1	6
Nitrotoluol	lb	0	1	4	to	0	1	5
Orthoamidophenol, base	lb.	0	18	0	to	1	0	0
Orthodichlorbenzol	lb.	0	1	1	to	0	1	2
Orthotoluidine	lb.	0	2	3	to	0	2	6
Orthonitrotoluol	lb.	0	0	10	to	0	1	0
Para-amidophenol, base	lb.	0	12	6	to	0	13	0
Para-amidophenol, hydrochlor	lb	0	13	0	to	0	13	6
Paradichlorbenzol	lb.	0	0	7	to	0	0	8
Paranitraniline	lb.	0	4	3	to	0	4	6
Paranitrophenol	lb.	0	2	9	to	0	3	0
Paranitrotoluol	lb.	0	5	9	to	0	6	0
Paraphenylenediamine, distilled	lb.	0	13	6	to	0	14	6
Paratoluidine	lb.	0	7	6	to	0	8	0
Phthalic anhydride	lb.	0	3	9	to	0	4	0
Resorcin, technical	lb.	0	7	6	to	0	8	0
Resorcin, pure	lb.	0	6	9	to	0	7	0
Salol	lb	0	3	3	to	0	3	6
Sulphanilic acid, crude	lb.	0	1	4	to	0	1	6
Tolidine, base	lb.	0	8	6	to	0	10	0
Tolidine, mixture	lb.	0	2	9	to	0	3	0

Metals and Ferro Alloys

The following prices are furnished by Messrs. Miles, Mole & Co., Ltd., 101, Leadenhall Street, London, E.C.

	per	£	s.	d.		£	s.	d.
Aluminium, 98-99%	ton	150	0	0	to	150	0	0
Antimony, English	ton	37	0	0	to	40	0	0
Copper, Best Selected	ton	74	0	0	to	75	0	0
Ferro-Chrome, 4-6%	ton	36	0	0	to	37	0	0
Ferro-Chrome Manganese, loose	ton	18	0	0	to	20	0	0
Silicon, 45-50%	ton	17	0	0	to	18	0	0
Tungsten, 75-80%	lb.	0	1	10	to	0	2	0
Lead Ingot	ton	24	0	0	to	25	0	0
Lead Sheets	ton	34	0	0	to	35	0	0
Nickel, 98-99%	ton	185	0	0	to	187	0	0
Tin	ton	169	0	0	to	170	0	0
Spelter	ton	26	10	0	to	27	0	0

Structural Steel

	Per	£	s.	d.		£	s.	d.
Angles and Tees	ton	18	0	0	to	19	0	0
Flats and Rounds	ton	15	0	0	to	16	0	0
Joists	ton	17	0	0	to	18	0	0
Plates	ton	19	0	0	to	20	0	0
Rails, heavy	ton	15	0	0	to	16	0	0
Sheets, 24 Gauge	ton	20	0	0	to	21	0	0
Galvanized Corrd. Sheets	ton	21	0	0	to	22	0	0
Zinc Sheets	ton	34	0	0	to	35	0	0

The Council of the Institute of Chemistry have appointed a special Committee to deal with questions relating to REAGENTS AND RESEARCH CHEMICALS, and state that they are prepared to assist chemists to obtain any materials which they may need. Acting on the advice of the Institute, certain manufacturers are providing articles, such as beakers, flasks, &c., distinctly marked to indicate their origin, but unmarked articles are also being offered for sale. The Institute has recently issued a letter urging users to purchase only laboratory glassware which bears the manufacturers' distinctive marks.

It is reported that a Chinese syndicate with a capital of $5,000,000 is about to start a BEET SUGAR FACTORY near Huangtaichia in the Shantang Peninsula. According to the report the necesary machinery has been ordered for the United States of America.

A sum of 19,500,000 marks is, it is reported, being spent on development work at the State's SULPHURIC ACID AND SUPERPHOSPHATE factories at Willmanstrand and Kotka in Finland.

Warehouses containing nearly 30,000 tons of nitrate have been destroyed by fire at Iquique, Chile.

Chemistry in the 19th Century

Work of Famous Chemists

THE first of a series of three lectures on "The History of Chemistry in the Nineteenth Century" was delivered on May 27 by Sir William A. TILDEN, in the Chemistry Theatre, University College.

University College, said the lecturer, was the great seat of a great school of chemistry, and in support of this statement he gave the names of well-known professors of chemistry since 1828. He referred to a table which he had drawn up showing the names of the most prominent chemical discoverers arranged in chronological order and showing at a glance who were contemporaries and what was going on in different countries.

Describing the state of chemistry in 1800, the lecturer said there was then no reference anywhere to such things as electrons or ions, but if his hearers would read the chemical literature of that period they would discover some strange things. In 1800 it was known that air consisted of oxygen and azote; these names were contrived by Lavoisier and were tolerably familiar. The famous Phlogistian, Joseph Priestley, was next referred to and some of his discoveries in connexion with gases were related and the lecturer then went on to the composition of air and water which was already known, but which was definitely established by Henry Cavendish in 1783. In this connexion the lecturer said he had noticed recently a tablet affixed to the wall of a house in Montague Place stating that Henry Cavendish lived there; he was of the opinion that it was in this house that Cavendish, who died in 1810, conducted his experiments on the composition of water.

In 1799 experiments were being made by Galvani and Volta which resulted in the production of the Voltaic Pile and the current evolved was accidentally turned to account a year later by Nicholson and Carlisle in their important observation on the decomposition of water. Richard Boyle, who died in 1691, had laid down the definition of an element and the lecturer gave a list of substances recorded in Dalton's book on chemistry as being elements. This list comprised hydrogen, azote, carbon, oxygen, phosphorus, sulphur, magnesium, lime, sand, potash, barytes, iron, zinc, lead, silver, platinum, gold and mercury. Many common elements were then not known and although Scheele had discovered chlorine, it was referred to by Lavoisier as oxymuriatic acid. The elements bromine and iodine were not discovered until 1812 and 1829 respectively and were in each case discovered by a chemical manufacturer.

The life of Sir Humphry Davy, who was born in 1778, revealed one of the most remarkable careers in modern science. Nicholson and Carlisle had shown that the current from the voltaic pile was capable of decomposing water, and it had also been shown that various salts could also be decomposed. Davy took up the subject, and was successful in decomposing soda and potash into three constituents. He also tried heating potassium in oxymuriatic gas, but only obtained what was then called a muriate.

To John Dalton was to be attributed the application of the atomic theory to chemistry, and the lecturer showed a chart illustrating the symbols originated by Dalton. It was almost entirely due to the skill of Berzelius that the atomic weights were correctly estimated.

Speaking of Michael Faraday, Sir William said he had seen Faraday once, shortly before his death, which occurred in 1867. The laws of electrolysis were among his great contributions to science. In 1811, Avogadro enunciated the fundamental law associated with his name; but, in spite of the clearness of his exposition and the importance of his discovery, the principle was not adopted for many years.

The simple law of combination among gases was discovered by the French chemist, Gay-Lussac, and, although this was thoroughly established about 1812, Dalton failed to see the advantage of its importance in supporting his own atomic theory.

In conclusion, the lecturer exhibited a letter written by Davy to Professor Brande.

The net quantity of NITRATE produced by the Salar del Carmen Nitrate Syndicate between March 8 and December 31 last amounted to 380,160 quintals.

Company News

UNITED INDIGO AND CHEMICAL CO.—The directors have declared a dividend at the rate of 5 per cent. per annum on the preference shares for the six months ending June 30.

ESPERANZA COPPER AND SULPHUR CO.—The net profits for 1920 were £14,599, and £7,198 was brought forward. A dividend of 5 per cent. is proposed, carrying forward £4,297.

NATAL AMMONIUM CO.—The accounts show that after writing off £1,631 for bad debts there was a loss for the year ended September 30 of £16,310, increasing the adverse balance to be carried forward to £18,901.

NEUCHATEL ASPHALTE.—Dividend for 1920 of 6d. per ordinary share, less tax, payable on a date to be subsequently announced. The last dividend paid on the ordinary shares was in 1915, when 2½ per cent. was distributed.

"SHELL" TRANSPORT AND TRADING CO., LTD.—The directors have declared a dividend of 25 per cent.—namely 5s. per share—free of tax, on account of profits for the year 1920, making 35 per cent. for the year, payable on July 5 next. For 1919 the dividend was also 35 per cent.

BRITISH PHOTOGRAPHIC INDUSTRIES.—After payment of the preference dividend, and an interim dividend of 10 per cent. on ordinary shares, and writing £10,682 off "expenses of issue account," the accounts for sixteen months to April 30 last show a credit balance of £27,954 to be carried forward. In June, 1920, a bonus of 50 per cent. was paid to ordinary shareholders in the form of fully-paid ordinary shares.

NEW TRANSVAAL CHEMICAL.—Accounts for the year to June 30 last show a profit balance, including £7,141 brought in, of £85,334. To depreciation, £9,680; preference dividends, £24,000; remuneration of London board, £630; dividend of 17½ per cent. on ordinary, £43,150; forward, subject to liability for excess profits duty (if any), £7,874. Meeting, Winchester House, June 14, noon.

BRUNNER, MOND & CO.—The accounts to March 31 last show a balance of profit after writing off stocks, £264,725, of £938,517 and £123,703 was brought in, making £1,062,220. After paying preference dividend, the directors propose a further dividend on the ordinary shares at 6 per cent. per annum, payable June 29, making 8 per cent. for the year less tax. The sum of £50,030 is placed to suspense account, leaving to be carried forward £141,308. Meeting, Exchange Station Hotal, Liverpool, June 15, at 1 p.m.

BRITISH CYANIDES CO.—This company paid an interim dividend of 5 per cent., free of tax, on the ordinary shares in December, but the directors now announce that the industrial situation precludes them from recommending a further distribution for the year ended April, although the preference dividend will be paid. The annual meeting will have to be deferred, as several questions have to be cleared up before the accounts can be completed. The company's factories are now closed, owing to lack of coal, but construction work upon the new furnace for the fixation of atmospheric nitrogen is being carried on and is nearing completion. For each of the last two years 10 per cent., free of tax, was paid, but the concern is larger now, the shares of the British Potash Company having been acquired early this year.

ZINC CORPORATION.—The net profit for 1920 was £31,910 (against £77,377 in the previous year). Adding £19,952, being appropriations unexpended and now written back, and £42,812, the balance brought forward, makes a total of £94,675. The sum of £27,000 (against £28,000) is appropriated for mine development and new plant; £23,265 is provided for income and corporation tax; and £10,000 for depreciation of stores. The preferential dividend for the first half of the year has been paid, absorbing £24,569, but in view of the uncertain outlook it is proposed to postpone the payment for the second half of the year until there is some improvement in the conditions at Broken Hill. This will leave a balance to be carried forward of £9,840. Ore reserves at the close of the year, exclusive of the zinc lode, were estimated at 2,115,700 tons (against 2,114,600 tons), averaging 14·6 per cent. lead, 2·6 ozs. silver, and 9·4 per cent. zinc. In the previous year the preferential dividend was paid in full.

BRITISH OIL AND CAKE MILLS.—The report for 1920 states that after adjustment of liability for E.P.D., income tax, Corporation profits tax, reserve contingencies, providing £5,000 for the staff pension fund, and placing £25,000 to reserve (of which £19,970 is premium on the remainder of the new issue of ordinary shares) there is a profit balance for the year of £414,464, and £22,010 was brought in, making £436,474. Out of this was taken £40,870 for preference dividend, while the ordinary dividend of 15 per cent. (paid 10 per cent. on September 6 last and 5 per cent. on March 7), accounts for £372,898 leaving to be carried forward £22,706. At the time the interim dividend was paid the directors anticipated that the final dividend would be at the same rate as for 1919, and this expectation was maintained up to October, when the fall in prices set in, which although for some time foreseen was unexpected in its suddenness and severity. The position changed so quickly during the last two months of the year that it became necessary to conserve the company's resources by making provision for further reduction in values and confine the rate of dividend to 15 per cent. for the year. The lower range of prices ruling since January 1 has restored some degree of confidence to markets, and it has been possible to transact considerable business at remunerative margins, and the company's operations are being conducted at a satisfactory profit. Towards the close of the year the company acquired a substantial interest in the business of Behrend & Co., Ltd., of London and Alexandria, the largest shippers of Egyptian cottonseed, which the board believe will prove a useful and profitable investment. Meeting, Winchester House, May 31, at 1 p.m.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

LOCALITY OF FIRM OR AGENT.	MATERIALS.	REF. NO.
Serbs, Croats, and Slovenes	Glass; disinfectants; lubricating oils. Replies to the Ekonomsko Odelenje, Miniotarstva Saobracaja.	—
Buenos Aires	Heavy and fine chemicals ...	714
Cape Town ...	Glassware	707

Tariff Changes

DENMARK.—The prohibition on the exportation from Denmark, except under licence, of potash and salts of potash, including fertilisers and chlorate of potash, has now been repealed.

FRANCE.—Margarine, oleo-margarine, edible fats, edible vegetable fats, aluminium ores (bauxite) may now be exported from France without special authorisation.

LATVIA.—Tar, turpentine, varnishes may now be exported (on payment of export duty) without the necessity of obtaining a special export licence from the Ministry of Trade and Industry.

SWEDEN.—Mineral oils, lubricating oils; the prohibition on the exportation has been withdrawn from April 25.

NETHERLANDS.—It is proposed to increase the import duties on soap, perfumed, transparent, hard, soft, and soap powder; scents, varnishes and other non-potable liquids prepared with alcohol containing more than 5 litres of pure alcohol at a temperature of 15°C.; wood spirit and liquids manufactured therefrom or mixed therewith; and solid matter containing wood spirit. The proposed new rates on these commodities are given in the Board of Trade Journal (May 19, page 569.).

SPAIN.—The Customs import duty of 50 centavos per 100 kilogs, on cement has been reimposed, but consignments proved to have been despatched direct to a Spanish port up to May 9, inclusive, will be admitted duty free. The free export of 100 000 metric tons of natural and artificial cement is authorised.

SWITZERLAND.—Aniline, anthracene and naphthaline colours and tar colours not specially mentioned in the Swiss General Customs Tariff; indigo, natural or synthetic; and indigo solution may now be exported from Switzerland under general licence.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

London Gazette

Partnership Dissolved

GARDNER, W., BRIGHTMAN, E., AND BORROW, P., carrying on business as Household Dye Manufacturers 38, Framfield Road, Highbury, N., under the style of "The Drayton Manufacturing Company," by mutual consent as and from May 4, 1921. All debts will be received and paid by Ernest Brightman and Philip Borrow.

Bankruptcy Information

LAUGHTON, F., Wren Green, Edge Lane, Stretford, Lancashire, rubber merchant. Receiving Order, May 28, 1921. No. of Receiving Order, 9. Creditor's Petition.

STOPFORTH, R. (trading as Rowland & Co.), residing at 59, Kimberley Drive, Crosby, Lancaster, carrying on business at 10, Eaton Street, Liverpool, and lately carrying on business at 71, Vauxhall Road, Liverpool, wholesale druggist. Court, Liverpool. Date of Receiving Order, June 2, 1921. Number of Receiving Order, 33. Debtor's Petition.

WHITEHEAD, C., The Horse and Jockey Hotel, Edenfield, works chemist. Court, Bolton. Date of Receiving Order, June 3, 1921. Number of Receiving Order, 17. Debtor's Petition.

Application for Discharge

HARRISON, E., Hillside, Duddington Lane, Neasden, Middlesex, trading in co-partnership with F. A. Bonaventura and H. E. Aveline as Felice Bonaventura & Co., at 24, Tower Street, London, E.C., chemical merchant and importer. High Court of Justice. June 29, 1921, at 11 a.m., Bankruptcy Buildings, Carey Street, London, W.C.2.

Companies Winding Up

CALVERT DYES, LTD., Steanard Lane, Mirfield, Yorks. High Court of Justice. May 31, 1921. Date of presentation of Petition, November 29, 1920.

NOBLES DRUG STORES, LTD. A petition for the winding-up by the High Court of Justice was on June 2, 1921, presented to the Court by the Western Tablet Co., Ltd., whose registered office is at 106, Church Street, Kensington, London, creditors of the company, and will be heard before the Court sitting at the Royal Courts of Justice, Strand, London, on June 21, 1921. Fladgate & Co., 18, 19, Pall Mall, London, S.W.1, Solicitors for the Petitioners. *Note.*—Any person who intends to appear on the hearing of the petition must notify the above-named not later than 6 p.m., June 20, 1921.

DYESTUFFS, LTD.—A petition for the winding-up subject to the supervision of the County Court of Lancashire held in Manchester was on May 31, 1921, presented to the Court by Synthetic Chemicals, Ltd., of Derwent Street, Derby, creditors of the Company, and will be heard before the court sitting at the Court House, Quay Street, Manchester, on Wednesday, June 29, 1921, at 10.15 a.m. Randolph Eddowes & Douglas, 30, Victoria Street, Derby, Petitioners' Solicitors. *Note.*—Any person who intends to appear on the hearing of the petition must notify the above-named not later than 6 p.m., June 28, 1921.

Liquidators' Notices

THE ANILINE DYE & CHEMICAL CO., LTD., 32-34, Lucy Street, Hulme, Manchester, Mr. J. Todd, National Buildings, St. Mary's Parsonage, Manchester, Liquidator.

PARRY PURE DRUG CO., LTD. (in liquidation).—A meeting of creditors will be held at the offices of the Liquidator, 1, Broad Street Place, London, on Friday, June 17, 1921, at 11 a.m. W. H. Stentiford, Liquidator.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, created after July 1, 1908, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges which would, if created after July 1, 1908, require registration. The following Mortgages and Charges have been so registered. In each case the total debt, as specified, in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced since such date.*]

ATLAS METAL & ALLOYS CO., LTD. (late Atlas Smelting Co., Ltd.), London, E.C.—Reg. May 26, £1,143 debentures, to H. S. Sugden and others, 52, Queen Victoria Street, E.C.; also reg. May 26, £32,888 second debentures; general charge. *Nil. November 19, 1919.

HYDRAULIC ENGINEERING CO., LTD., Chester.—Reg. May 30, £20,000 second debentures, secured by Trust Deed dated May 23, 1921; charged on capital redemption policy in Norwich Union Life Assurance Society, and general charge. *£8,900. April 6, 1921.

LION ESSENCE & CHEMICAL CO., LTD., Brighton.—Reg. May 18, £1,000 debentures (filed under Section 93 (3) of the Companies (Consolidation) Act, 1908), present issue £250; general charge. *Nil. May 11, 1920.

LIQUID AIR & RESCUE SYNDICATE, LTD., London, N.W.—Reg. May 27, £3,000 debentures; general charge. *Nil. June 18, 1920.

Satisfaction

ACME CHEMICAL CO., LTD., Tonbridge.—Satisfaction reg. May 31, £200, part of amount outstanding July 1, 1908.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

GRITT (W.), LTD., Sourbridge Garage, Stedman Road, West Southbourne, oxygen acetylene welders, £20 18s. 10d. April 22.

GAZELAND CHINA CLAY CO., LTD., 39, Victoria Street, London, £45 16s. 8d. April 19.

NOBLES DRUG STORES, LTD., 2 Well Street, Cable Street, London, E.1, chemists, £60 11s. 2d. April 13.

NOBLES DRUG STORES, LTD., 2, Well Street, Cable Street, London, E.1, chemists, £13 3s. 7d. April 20.

PINK, A., 13, Wavenden Avenue, Chiswick, chemist, £11 11s. 6d. April 19.

HICKS MILLS ELSWORTHY & CO., LTD., R/O Haydons Bridge, Wimbledon, wholesale druggists, £33 3s. 9d. April 23.

BLUNT, W. H., & SON, 69½ & 70, Snow Hill, Birmingham, druggists, £22 5s. 5d. April 19.

New Companies Registered

The following list has been prepared for us by Jordan & Sons, Ltd., company registration agents, 116 and 117, Chancery Lane, London, W.C.2:—

ANGLO INDIAN DRUG STORES, LTD., 22, Great Windmill Street, W.1. Chemists and druggists, &c. Nominal capital, £1,000 in 1,000 ordinary shares of £1 each. Directors: S. S. Tug (managing director). Qualification of directors, 100 shares.

M. M. MITCHELL, LTD., Coal, coke, lime and oil fuel merchants, &c. Nominal capital, £15,000 in 100 ordinary shares and 1,400 preferred shares of £10. Directors: M. M. Mitchell (permanent director). Qualification of directors, £100. Remuneration of directors, £600 per director.

H.M.S. PETROLEUM CO., LTD., Boston Buildings, Cardiff. To deal with petroleum, paraffin and other oils. Nominal capital, £1,000 in 1,000 shares of £1 each. Directors: Henrietta M. Sutherland, R. B. Sutherland. Qualification of directors, £10.